--FINAL REPORT--

A Medicare Multiple Choice Program for Minneapolis and St. Paul

A Contract 500-78-0081

InterStudy
April 2, 1984

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TABLE OF CONTENTS

		Page
SUMMARY OF REPORT		1
I.	HISTORICAL PERSPECTIVE	7
II.	INTERSTUDY'S ROLE	11
III.	CASE STUDIES OF PARTICIPATING HMOs	18
	SHARE Health Plan	18
	MEDCENTER Health Plan	23
	HMO MINNESOTA	28
	NICOLLET-EITEL Health Plan	31
IV.	APPENDICES	36
	1. Reasons For Applying To An HMO	37
	2. Reasons For Not Applying To An HMO	38
	3. Prospective Capitation Demonstrations Projects: 1980-1981	39
	4. Enrollment Growth Pattern For Minnesota Demonstration Projects	40
	5. Demonstration Site Characteristics	41
	6. Cost And Utilization Characteristics For Three Minnesota HMO's	42
	7. Beneficiary Premiums	43
	8. Twin Cities Medicare Demonstration Enrollment: 11/80 to 11/83	44
	9. Survey Of Demonstration Site Enrollment Statistics	45
	10. APC/AAPCC Values For Demonstration Sites	46
	11. Medicare Capitation Demonstrations Open Enrollment Period (Projections And Actual Enrollments)	47
	12. Comparison Of Medicare Benefit Packages For 1981: Standard Medicare and HMO Demonstration Coverage	48
V.	HOSPITAL RESOURCE ALLOCATION FOR DECEDENTS AND SURVIVORS OVER 65	54
VI.	APPENDICES	81
	Footnotes	82
	Glossary	89
	Tables	94

SUMMARY STATEMENT

InterStudy has been actively trying to influence and to change the United States health care system for more than twelve years. Under the leadership of Paul M. Ellwood, Jr., the organization has continually addressed the issues surrounding financing health care and the development of health delivery systems which provide both quality and appropriate health care at a reasonable cost. We at InterStudy are convinced that competition is an essential element for not only providing choice for users, but to stimulating health care delivery systems to provide high quality care at reasonable costs.

This Medicare Competition Demonstration Project provided the opportunity for InterStudy, HCFA, and HMOs in the Twin Cities area (MedCenter, Nicollet-Eitel, SHARE, and HMO Minnesota) not only to test the feasibility of providing prospective health care coverage to Medicare enrollees, but to make the policy and regulatory changes necessary for it to be an attractive alternative to both HMOs and to Medicare beneficiaries. In 1978 when the project was started, the major questions to be addressed were as follows:

- Could Medicare regulations, which were patterned after the traditional retroactive fee-for-service reimbursement system, be amended and changed to accommodate the prospective reimbursement necessary to involve HMOs?

- Could HMOs demonstrate the same cost savings with the Medicare population that they have accomplished with other groups?

- Would Medicare beneficiaries be willing to select or join an HMO in lieu of their traditional fee-for-service coverage which among other things was tied to their personal physician and familiar health care settings (hospital, pharmacy, clinics, etc.)?

- Would the presence of four participating HMOs in the Twin Cities area lead to competition to enroll Medicare beneficiaries by development of cost-efficient charges in medical practice and the offer of expanded packages at reduced rates?

- Would the prospective funding of Medicare benefits through HMOs result in cost savings for the government and for the Medicare eligibles without cutting quality of care?

InterStudy's past experience with HMOs led us to believe that the answers to these questions would be "yes". Furthermore, it was felt that many of the health care practices which have become associated with HMOs would be compatible with the health care needs of older people. The use of nurse practitioners, physician assistants, and other less costly professionals coupled with the strong HMO commitment to education and prevention are frequently appropriate for the elderly who have more chronic than acute disease or illness.

The activities and function performed by InterStudy and descriptions of the participating HMOs are summarized in other sections of this report. This section will deal with our perceptions of the impact and value of the project. Without access to the evaluative data gathered by Jurgovan and Blair, Inc., Research Triangle Institute, Systemetrics, Inc., and Actuarial Research Corporation, these observations are based on discussions with clinic and administrative staff members of participating HMOs and reflect what we consider to be the significant lessons learned.

HMOs can indeed provide cost-effective, high-quality care to Medicare beneficiaries and not suffer financial loss. The initial negotiated rate (95% of the AAPPC) realized an immediate savings to the government and experience indicates that the HMO packages reduced the out-of-pocket expenses of enrollees. Perhaps the most important lesson learned not only in the Twin Cities area but in all participating areas is that Medicare eligibles are able and willing to pay for enriched or expanded care packages. Foot care, dental care, medication, home care, etc. are recognized by the elderly as being valuable enough to purchase if given the opportunity. This is not surprising when we take into consideration the number of supplementary and medigap insurance policies purchased by that group. HMOs have been slow to capitalize on the willingness of their senior enrollees and have been fairly conservative in their offerings which may reflect their roots in the acute care system.

Marketing has proven to be essential though difficult with the Medicare population. Because HMOs find themselves dealing with individuals rather than groups, marketing becomes more like advertising -- there are no labor unions or large employers for the over sixty-five group. Talks at senior centers, congregate meal sites, and other gatherings of seniors are time consuming and costly. Newspaper and television advertisements attract some enrollees, but word of mouth from friend to friend is most effective. As the HMO concept becomes more accepted by the general population, more individuals will "age-in" the Medicare program and concomitantly the need for marketing will go down. With nearly 20% of the health market in the Twin Cities already enrolled in an HMO, the marketing function may not be as important, but currently it is essential. The Twin Cities HMOs' enrollments fluctuate with marketing efforts. The marketing activity has become an interesting mechanism for control of who enrolls in the HMOs. It is possible for an HMO to control adverse selection through its marketing strategies by targeting younger, more healthy seniors. From our observations it seems that HMOs can use marketing as a means of controlling both numbers and types of enrollees.

While experience has indicated that the older, sicker, more vulnerable elderly are not willing to change health plans, HMOs still plan and operate as though they will. Cursory looks at the information which we have seen indicates that those willing to join HMOs are younger and more active. Two things become quite clear: 1) HMOs must continue their efforts to enroll new retirees to offset the aging of their current Medicare enrollees and thus have a large enough group among whom to spread the risk, and 2) if HMOs are forced into enrolling the Medicaid population they will indeed have their worse fears met because that is the oldest and sickest group demographically speaking.

The five years of the demonstration project were largely taken up with system problems. As described in section III, almost two years were consumed with negotiating regulatory changes for prospective reimbursement and selection issues. HMOs were not accustomed to dealing with the government (HCFA) and HCFA was not accustomed to dealing with alternative health plans. The full details of that saga are described in the quarterly and annual reports and are mentioned here only to point out that the clinical aspects of the Medicare Demonstration were slow in getting started because of systems and

administrative details which had to be worked out first. We had anticipated that HMOs would be challenged by and innovative with their Medicare enrollees, but it is really too soon to know what changes will occur as the numbers and the age of enrollees increase. Thus far, only a few changes have been initiated and those changes are more in response to HMOs' needs than to the needs of the elderly.

Among the first lessons learned by the HMOs was that the newly enrolled Medicare beneficiary did not understand nor know how to appropriately use the services. MedCenter has developed the most direct solution to the problem by setting up classes for its Medicare group in addition to the usual packet provided new enrollees. The new Medicare enrollees are invited to participate in an orientation session one month after enrolling, during which time procedures are discussed and questions answered. MedCenter feels that the orientation sessions discourage inappropriate use of services and cut down on the problem of seniors going to non-HMO providers with the expectation of being reimbursed. The sessions also include a blood pressure check to identify high-risk patients. None of the other Twin Cities HMOs have developed special programs to teach the seniors how to use their system. This may reflect the lack of experience with that group.

There seems to be agreement that the Medicare patients require more time during appointments than other patients which concurs with the geriatric experience in other settings. The advantage that the Health Maintenance Organization has over the private practice physician is the availability of less costly health professionals who can meet some of those needs of the enrolled Medicare population which do not require a medical opinion. the Twin Cities HMOs are all developing some form of case management by nurse practitioners, social workers, or LPNs who assess the enrollees' needs, arrange for services, and monitor progress. The case manager provides a contact for the older person who they can get to know and trust; the case manager also serves as well as a "screen" to prevent inappropriate use of physician time.

How heavily the Twin Cities HMOs continue to be involved in providing services depends upon a number of things, but the most influential of course will be the reimbursement rate determined by TEFRA. In talking with those HMO staff

members involved in the demonstration, it would seem that financing will be the determining factor. MedCenter has developed a five-year plan for geriatrics which includes a number of changes to better serve their senior population, but they are hesitant to commit themselves until the financial issues are resolved. SHARE continues an aggressive marketing campaign but has made few changes in the clinical program.

At InterStudy we view the project with mixed emotions. On the one hand we can see and document the success. The recent entry of Group Health which refused to enter the project earlier is indicative that HMOs can be convinced to enter into the Medicare market. The Medicare enrollment has increased to 32,193 and most enrollees are pleased with the HMO health plans.

On the other hand, the HMOs have been reluctant to be aggressive in developing geriatric programs and getting into long-term care services which older folks need. There has been little effort to educate their physicians to the needs of elderly patients. Despite the capacity to expand benefits to include more or less expansive services such as education and prevention, little has been done. MedCenter has developed some educational programs and, as discussed in another section, has attempted some prevention. It would be expected that an HMO health care system would be willing to shift its focus from acute care to long-term care. Perhaps time and experience will bring that shift. The Social Health Maintenance Organization is a step in that direction.

The questions posed at the outset of this demonstration project have been answered in the affirmative. The solution to the problems posed by the potential need for health care of a rapidly increasing geriatric population have not. We hope that Health Maintenance Organizations will take a more aggressive position in addressing the delivery of both acute and long-term health care to the Medicare population.

As a result of InterStudy's involvement in the Medicare Demonstration Project and our historical interest in cost containment, we embarked on a closely related research study revolving around the cost associated with resource allocation for terminal and deceased Medicare beneficiaries. Based on the knowledge that previous studies have indicated, that as much as 28.2% of

Medicare expenditures are allocated to elderly who are in their last year of life, we sought and got participation from a very large Twin Cities hospital which has patients from one of the participating HMOs to cooperate with us in analyzing the charges, procedures, and demography of all patients over sixty-five who had died in the years 1981 and 1982. We had hoped to identify differences between those enrolled in an HMO and those who were not, but insufficient numbers of HMO enrollees dying made that statistical analysis impossible. A standard version of the study is in Section V with Appendices in Section VI. Further examination of the data is being conducted with plans for a monograph in the future.

I. HISTORICAL PERSPECTIVE

Controlling costs within federal entitlement programs, including Medicare, has been an objective of the government almost since the inception of these programs. National health expenditures, of which Medicare is a major portion, account for an increasing percent of the Gross National Product. As TABLE 1 indicates, health expenditures increased from 4.4% of the GNP in 1950 to 9.8% of the GNP in 1981. Estimates for the year 1990 put the percent of the GNP allocated for health at 12%.

Two factors in particular have forced increased scrutiny of many aspects of the Medicare program: estimates that the Medicare Hospital Trust Fund could be depleted within a decade due to medical care cost inflation and demographic trends which show that the proportion of individuals over age 65 is expected to double between 1970 and 2030. Thus the question has become: How will the Medicare program support its current beneficiaries, much less a steadily rising number of anticipated future beneficiaries?

Over the past two decades, and three presidential administrations, the federal government has pursued at least two approaches to slowing Medicare program expenditures: (1) increased beneficiary copayments and deductibles and more restrictive reimbursement policies, and (2) promotion of prepaid health plans, particularly Health Maintenance Organizations (HMOs). In 1978 the Health Care Financing Administration awarded funds for a Medicare HMO demonstration project, to be carried out in the Twin Cities. The project was designed to investigate whether a fully prospective capitation arrangement is an appropriate payment mechanism for the Medicare program and further, to document the impact of a highly competitive medical care system on the premium rate, benefits, and services delivered to the enrolled Medicare population. This report will focus on InterStudy's role in the planning and execution of this demonstration project, Federal Contract No: HHS-500-78-0081, entitled, "A Medicare Multiple Choice Program for Minneapolis and St. Paul".

TABLE 1

National Health Expenditures and Percent of Gross National Product
Selected Calendar Years, 1950-1981

Calendar Year	Gross National Product (billions)	Amount (billions)	Per Capita	Percent of GNP
1950	$ 286.5	$ 12.7	$ 82	4.4%
1960	506.5	26.9	146	5.3
1970	992.7	74.7	358	7.5
1971	1,077.7	83.3	394	7.7
1975	1,549.2	132.7	604	8.6
1979	2,417.8	215.0	938	8.9
1980	2,633.1	249.0	1,075	9.5
1981	2,937.7	286.6	1,225	9.8

Source: Robert M. Gibson and Daniel R. Waldo, "National Health Expenditures, 1981", Health Care Financing Review, September 1982.

The 1965 amendments to the Social Security Act, which created Medicare, were passed after many years of political debate. The debate centered around the appropriate public role in the provision of health care in this nation. Before the New Deal era, physician and hospital costs were paid directly to providers by individuals. The depression left many individuals unable to cover the costs of medical care and the health care industry incapable of predicting, with any reliability, their incoming revenues. The American Hospital Association responded to the problem of reduced revenues by establishing Blue Cross-Blue Shield as the first fiscal intermediary between patients (subscribers) and hospitals. The Blue Cross model of third-party payment provided a solution to the economic problems of the health care industry without disturbing the traditional patterns for delivering care.

By the late 1930s the consumer cooperative movement had established the Group Health Association (GHA) in Washington, D.C.. GHA and later the Kaiser Foundation provided prepaid alternatives to the Blue Cross model of health insurance. While these alternatives offered insurance protection for most individuals and businesses, two groups were notably neglected: (1) the poor and (2) the elderly. Before the passage of Medicare and Medicaid (Title XVIII and Title XIX of the Social Security Act) the States received federal dollars to aid the entitled poor and elderly under the Kerr-Mills Act.

While the Medicare program enacted in 1965 was structured much like the traditional Blue Cross-Blue Shield model, it did include a provision for reimbursement of health services prepayment plans for the delivery of Part B services (physicians' services) to Medicare-eligible plan enrollees. Under this provision (Section 1833(a)(1)), plans could be reimbursed directly, instead of through their physicians, on a reasonable charge or reasonable cost basis. Still in existence today, this section is the basis for the Group Practice Prepayment Contract ("GPPP Contract") between Medicare and health prepayment plans. Existing contracts involve many types of plans other than HMOs, such as labor union health plans and employee benefits plans.

Growing federal interest in the promotion of HMOs led to the passage of a provision in the Social Security Amendments of 1972 for reimbursing "health maintenance organizations" for delivering Parts A and B Medicare services (Section 1876). Paul M. Ellwood, Jr., then executive director of the American Rehabilitation Foundation, the Minneapolis-based research arm of the Sister Kenny Institute, provided the conceptual basis and was the central figure in the development of the health maintenance strategy.

Although authorization for HMO risk and cost contracts was passed in 1972, final regulations were not published until 1976. Thus, HMOs were prevented from entering into these contracts with the Medicare program until 1977. Even when the regulations appeared, the cost and risk contractual arrangements received a cool reception from HMOs, and by January of 1978 only 18 HMOs had entered into cost basis reimbursement contracts and only one HMO had entered into a risk contract. Also, by 1978 only about 27,000 Medicare eligibles had enrolled in HMOs under these contractual arrangements.

Dr. Paul Ellwood, now president of InterStudy, was among those who believed that the prospective capitated payment mechanism offered by HMOs would reduce federal health care expenditures. Further, Dr. Ellwood believed that quality of care could be ensured through encouraging competition among provider organizations. The Twin Cities area offered a natural setting to test the validity of these views.

Of the seven HMOs in the Minneapolis-St Paul area, only SHARE was Medicare certified to provide care for Medicare beneficiaries on a shared risk basis. Dr. Ellwood and the staff at InterStudy negotiated with the seven provider organizations to encourage their participation in a federally funded demonstration project to be carried out in the Twin Cities area.

II. INTERSTUDY'S ROLE

The Twin Cities Metropolitan area, which includes Minneapolis and St. Paul, has a total population of 1.94 million. The Twin Cities area is unique in the country because of the large number of HMOs operating in one metropolitan community. Approximately 13% of the 1.94 million population (over 250,000 enrollees) are in HMOs.

In 1978, HCFA awarded contracts in seven different locations throughout the United States in order to test the capitation approach with HMOs and Medicare. InterStudy, a nonprofit health policy research firm in Excelsior, Minnesota, received the only contract to be carried out in a multi-HMO setting (the four participating Twin Cities HMOs were: SHARE, MedCenter, HMO Minnesota, and Nicollet-Eitel). The InterStudy contract was unique because it is the only area in which the HMOs are competing with one another for Medicare enrollees. It is also the only location of the selected seven nationwide in which HMOs are permitted by HCFA to use health status screening for high-option plans.

As contracted with HCFA in the Twin Cities, InterStudy's role was to serve as overall coordinator of the project as well as ombudsman for consumers. InterStudy's role will be examined in four specific tasks:

1) The Brokering Role:
Getting the HMOs to join the project and to cooperate and work efficiently together and with HCFA.

2) The Marketing/Educational Role:
Assisting the participating HMOs with their initial marketing efforts.

3) The Ombudsman Role:
Serving as a troubleshooter between consumers and the HMOs.

4) The Wrap-Up Role:
Helping eventually to close down the project.

The Brokering Role:

As overall project coordinator of the Twin Cities demonstration site, one of InterStudy's tasks was to facilitate communication among the various

participants to implement the project in such a fashion as to preserve and promote competition among the HMOs and to serve as a non-partisan advocate for the program in general. Besides managing inter-HMO communication, InterStudy also served as the go-between for HCFA and the HMOs. This task involved disseminating information provided by HCFA, as well as providing project data to HCFA's representative where contractually obligated.

InterStudy's means of accomplishing these objectives were to serve as facilitator during resolution of issues, and to transmit appropriate information among the various parties. HCFA, on the other hand, was understandably most concerned with directing the project so as to maximize government savings, preserve its regulatory ability, and assure fairness to consumers. In light of the divergent perspectives of InterStudy, HCFA, and the HMOs, it is not surprising that disagreements arose during the course of the development and implementation of the project. Since each of the parties had specific expectations going into the project, it was inevitable that some conflict would arise in the process of arriving at a mutually acceptable course of action. What must be kept in mind, however, is that InterStudy had undertaken a very difficult project in the only multi-HMO setting in the country and that with tremendous persistence, creativity, and flexibility it finally cajoled four competitive HMOs into participating successfully in the project.

The Marketing/Educational Role:

In 1981, at the actual commencement of the project, InterStudy took a very active role in educating the public about the HMOs and Medicare and in marketing the different plans. This was necessary, initially, because the HMOs were:

- relatively inexperienced in the aging area and hesitant to undertake all-out marketing campaigns until they were more certain of the risks to which they would be subjecting themselves.
- unfamiliar with the unique concerns of senior citizens and had had very little experience selling to this population.
- uncertain about the type of media approach that would most effectively and efficiently reach the seniors and persuade them to join.
- inexperienced with marketing to individuals, as the bulk of their past efforts involved selling to employees and employer groups.

- were uncertain what to project in terms of enrollment patterns because there had been very little prepaid experience with the elderly.

The HMOs' first marketing activities took place preceding and during the 1981 open enrollment period, although InterStudy conducted a far more extensive effort than did the HMOs. In designing its marketing strategy, InterStudy identified at least four sources of enrollees:

1. Current health plan members who turn 65 and become eligible for Medicare.
2. Group enrollment through an employer or former employer.
3. Medicare beneficiaries who are members of a particular organization (fraternal, religious, senior group, etc.).
4. The general pool of non-institutionalized beneficiaries who live in the plan's service area.

InterStudy also identified special considerations in marketing to the Medicare population. Among these were: the importance of health and health care services to the elderly and disabled; prior exposure to unsatisfactory health care and health insurance programs; the need for trustworthy sales personnel and credible promises; the need for clarity and explicitness in written materials; and the importance of word-of-mouth in enrollment and retention.

In 1981, there were several facets to InterStudy's marketing efforts. First was the "Wiser Buyer" consumer education program which included educational meetings conducted in various senior and community centers, churches, and other public gatherings. Approximately 80 such meetings were held during April and May of 1981, conducted by InterStudy staff. These public meetings included slide presentations, distribution of educational literature, and question and answer periods.

Second, a telephone information line was set up to respond to questions emanating from these meetings and from a special HCFA mailing sent to all Medicare beneficiaries in the service area at the outset of the first open enrollment period (May 1981). Over 4,000 calls were received by InterStudy during the initial one-month open enrollment period. Nearly 2,000 applications were received by the HMOs during this time.

Third, InterStudy prepared and distributed a ten-page brochure that summarized the program and provided answers to the most commonly asked questions. The brochure included a comprehensive benefit comparison sheet, a list of community educational meetings, and a map of each HMO's clinic location. As part of the overall educational effort, the pamphlet was distributed at all community meetings and was sent to anyone who inquired about the program by phone or mail.

Fourth, InterStudy conducted a fairly extensive media campaign, securing coverage in newspapers and organizational newsletters, and on radio and television. As discovered in comments made by telephone callers, a substantial number of senior citizens had been exposed to the various forms of publicity.

Fifth, in order to more clearly understand senior citizens' perceptions of the Medicare project, InterStudy used funds from the Burden Foundation to conduct a survey of some of the telephone information line callers (December 1984). A total of 3,722 callers received a copy of the survey in the mail, and 27% of them responded. Among other things, the survey questioned individuals as to why they would or would not join an HMO. Some of the reasons cited for joining included the following:

- benefit package attractive;
- hospital and clinics convenient;
- premium is low;
- personal doctor is in HMO;
- friends and family encouraged joining;
- always wanted to join an HMO;
- not eligible for other health insurance;
- doctor encouraged joining;
- was HMO member before retiring;
- other (dissatisfied with current insurance, no paper work, good program, no established physician relationship).

Reasons offered as to why they would not join were as follows:

- personal doctor not in HMO;
- facilities inconvenient;
- supplemental insurance paid up;
- program is experimental;
- preferred hospital is not affiliated with HMO;
- premiums too high;
- spend too much time away from Twin Cities;
- benefit package unattractive;
- program too confusing;
- concerned that premium will increase;
- other (not eligible, need more information, want to choose own doctor, don't think can get in, spouse not eligible).

Sixth, although InterStudy's main educational activities were directed toward consumers, efforts were also made to educate providers about the project. As the main overseers of health care services, it was imperative that the providers be familiar with the new avenue through which some senior citizens were to receive care. In March of 1981, a conference was held at Fort Snelling to which representatives of selected health care institutions and key consumer groups were invited. The attendees included representatives of insurance companies, medical societies, home health agencies, councils on aging, state and city health departments, planning agencies, county health and social service organizations, and charitable organizations. Three separate meetings were conducted during the conference to address the particular concerns of the various groups represented, and at each meeting, background was provided by InterStudy, HCFA, and the HMOs. The meetings served not only as general information sessions but also to clarify the role of the demonstration project to the provider community.

To broaden its 1981 marketing activities, InterStudy directed its 1982 efforts toward reaching more senior citizens and advocacy groups (as opposed to individuals). In order to maximize its outreach to as many eligible enrollees as possible, InterStudy worked with organizations having a high degree of contact with the elderly. Since many of the groups had well-established means of dispensing information, it was efficient to take advantage of their previous experience in dealing with senior citizens.

The primary group with which InterStudy interacted was the Metropolitan Senior Federation (MSF). MSF regularly advised its members on health care issues anyway, so it was natural that they would serve as a clearinghouse for HMO/Medicare information. Since MSF already operated a health insurance telephone line, the HMO information was simply incorporated as one of the options about which callers were informed.

A second organization through which InterStudy reached potential enrollees was the Social Security Administration (SSA). Since many senior citizens trust the SSA as a reliable source of health insurance information, it was felt that the credibility of the demonstration project would be enhanced if senior citizens heard about it through this means. The SSA made a major contribution to

InterStudy's educational efforts by allowing its telephone number to be listed in InterStudy's public service announcements. InterStudy staff members then met with operators of the SSA telephone information line to inform them about the mechanics of the program, and to let them know where they could direct people for further information.

In addition to its liaison with these senior citizen organizations in 1982, InterStudy's educational efforts included a number of group presentations at selected senior centers and churches. For the most part, the presentations were coordinated at the request of senior citizen coordinators who had sponsored information sessions in 1981 and represented valuable follow-through on previous efforts.

The media component of InterStudy's 1982 educational efforts paralleled the 1981 campaign, as advertising was conducted via press releases, public service announcements, radio, television, and print advertising. One bonus of the second year was that many HMO enrollees endorsed the program through word-of-mouth advertising. These endorsements made seniors more receptive to the media messages once their friends had generated their interest.

The 1982 open enrollment results were favorable. During the open enrollment month, more than 200 Medicare members joined, bringing the July 1, 1982 membership to over 11,000.

By 1982, InterStudy's marketing role was significantly reduced, as the HMOs had each made a strong commitment to expanding their programs in view of the successes they were experiencing in enrolling senior citizens. Each HMO began to assume an aggressive, extensive marketing effort. As a result, InterStudy focused on supplementing the HMOs' activities with public service announcements, press releases, and distribution of benefit comparison sheets. The results during the 1983 open enrollment were favorable, as there was a 12 percent increase between March 1 and May 31.

In sum, one of InterStudy's primary functions was to coordinate the education and public awareness campaign. As mentioned, this task was greatest in the early stages of the project, since most of the HMOs were not making a concerted effort to market their own programs. This role tapered off sharply as the HMOs became more committed to the project and convinced of its value and viability.

The Ombudsman Role:

InterStudy's communications task included serving as an ombudsman for Medicare/HMO enrollees who had comments or complaints about their experience in the demonstration project. This function was significantly less important than originally anticipated, since the few grievances brought to InterStudy's attention were very easily resolved. Likewise, although the HMOs had extensive discussions with HCFA concerning grievance procedures to be followed, there was no need to employ the procedures, as any problems brought directly to the HMOs by members were also solved very readily. Although InterStudy originally planned to conduct periodic subscriber satisfaction surveys, this task was dropped during the course of contract negotiations, and instead was included as a component of the overall project evaluation conducted by Research Triangle Institute.

The Wrap-Up Role:

A final function which InterStudy was originally slated to perform was closing down the demonstration project. Although InterStudy's role ended as planned in 1983 after the successful implementation of the project, the HMO/Medicare Project continues. The four HMOs have signed up to continue the project, a sure indication of the success of the venture.

III. CASE STUDIES OF PARTICIPATING HMOs

SHARE Health Plan:

SHARE Health Plan is a group model HMO with a full-time physician staff of 15 employed directly by the HMO. SHARE has been in operation since 1974 and has over 40,000 enrollees. For inpatient services, it contracts with three hospitals -- Samaritan, Midway and St. Paul Children's -- in the metropolitan area.

SHARE is a federally certified HMO, and is also the only demonstration plan in the Twin Cities which had had a previous Medicare contract. It had a cost reimbursement contract under Section 1976 of the Social Security Act, and successfully transferred 2,192 enrollees over to the Demonstration Project contract in December 1980. In view of this enhanced familiarity with the risks involved in serving senior citizens, SHARE was the most eager of the HMOs to assume the financial liability for the elderly members.

In contrast to expectations, there was very little competition between HMOs during the first open enrollment, as SHARE took the most aggressive role in marketing. Since SHARE had had at least some prior experience serving senior citizens via the cost contracts, they were more knowledgeable about what the implications and risks of serving the population would be. As a result, the competition was mostly between SHARE and traditional Medicare instead of being among all four of the HMOs at this early stage.

SHARE conducted the most intensive and comprehensive marketing campaign throughout the demonstration. Since they already had 2,200 Medicare patients enrolled in cost contracts (as a result of the 1980 HCFA mailing that prompted 10,000 inquiries), they were able to begin their marketing efforts prior to the official 1981 open enrollment period. In August of 1980, SHARE sent a letter to 3,000 Medicare patients introducing the program. In the months of August through October, they also initiated television advertising, put up posters in clinic waiting rooms, and made presentations to senior citizen groups. The results were favorable, as there were 424 enrollments by November 1 and 1,941 by December 1.

Aside from the specific coverages offered in the HMOs' benefit packages, some additional provisions were made by several of the HMOs to meet the special needs of their senior members. SHARE, for example, billed itself as "the Plan that Cares", and made an attempt to accommodate the elderly by making various operational changes. For instance, SHARE noted that senior citizens called on the telephone twice as often as other patients, and tended to talk twice as long. As a result, SHARE made the staffing changes necessary to meet this increased need for service. SHARE also recognized that seniors often required longer medical appointments than did most other patients, since they tended to have many questions for the clinical staff. This observation provided the impetus for making some changes in office procedures and scheduling of appointments as well. During the 1981 survey of callers to InterStudy's information line, a number of SHARE members mentioned that they appreciated the special treatment accorded to them.

SHARE also advertised "unlimited hospital days" and found this provision useful from a marketing standpoint, even though it exceeded the Medicare requirements. SHARE also had the highest acceptance rate in its health screening, as they approved 85% of the applicants for high option.

SHARE 1981:

SHARE remained the most active marketer of the demonstration program in the Twin Cities area. SHARE was also the most successful of the Minnesota plans in enrolling new members. It offered three months of premium-free enrollment for early enrollees (those enrolling before April 1981), advertised with placards on the sides of city buses, and offered premium discounts of $5 to enrollees who were responsible for bringing in new members. Not to be ignored is the fact that SHARE had been offering HMO membership to seniors through a cost reimbursement contract for two years prior to the inception of the demonstration project. Almost all of these were shifted into the demonstration. SHARE began actively enrolling members by shifting them over from the cost contract before the open enrollment period in May 1981. Only 93 of 387 applicants to SHARE's high option during May 1981 did not pass the screening.

From January to March 1981, SHARE initiated a "Get Acquainted Offer", which offered three months of free membership to those who enrolled before March 31. Existing members were invited to "SHARE with a friend" and receive a $5 rebate on a premium or prescription if the friend joined. As a further incentive to join, SHARE heavily advertised its premium decrease of 20 percent, making it the least expensive HMO offering in 1981 with a premium of $14.95 per month.

SHARE also initiated a variety of other activities during the pre-open enrollment period, including purchasing a mailing list and sending information to 40,000 senior citizens, placing posters in SHARE waiting rooms from November through open enrollment, and inserting literature in direct deposit envelopes of Social Security recipients. As in the latter part of the 1980s, SHARE also conducted television, radio, and newspaper advertising. Forty presentations were made to senior citizen groups during December 1980 and January 1981. Finally, SHARE's marketing campaign benefited from the Minnesota Senior Federation's endorsement, which was noted in the MSF newsletter and thus seen by thousands of senior citizens. The results of SHARE's enrollment efforts were positive, as 500 applications were received during the open enrollment, of which 95 percent were approved for high option coverage. By July 1, 1981, SHARE's total enrollment was 5,157.

A second "Get Acquainted Offer" was undertaken from late July through October of 1981. Using another purchased mailing list, SHARE sent information to 30,000 senior citizens. This effort was supplemented with newspaper and television advertising, notices in the MSF newsletter, and presentations to 40 senior citizen groups. This campaign yielded 750 applications, with 6,181 members being enrolled by December 1, 1981.

The third and most successful "Get Acquainted Offer" took place from November 1981 to January 1982, during which a mailing was sent to 100,000 senior citizens. Several newspaper and television advertisements followed up the November mailing. Twice as many group presentations were made as compared to previous "Get Acquainted Offers", with nearly 80 being conducted between November and January. One additional incentive to join was that while the offer still included three months of free coverage, the value was greater since

the premium had risen to $19.75. This campaign significantly boosted SHARE's membership, as 2,954 applications were received subsequent to this effort.

SHARE 1982:

In 1982, SHARE Health Plan continued to aggressively seek out the senior market and expand their activities in many directions. SHARE expanded its Medicare program by offering enrollment to residents of selected Northern Minnesota counties the options to enroll in the plan. In particular, they extended their contract to include St. Louis County. When their advertising campaign created some concern for the local providers, SHARE responded to these by modifying their approach. At the present time, their enrollment on the Range is approximately 925 members.

During the first part of 1982, SHARE continued to have problems with out-of-plan use. InterStudy contacted Kaiser-Portland (another HMO in the Medicare demonstration) for help in advising SHARE of some successful educational techniques used in describing lock-in to beneficiaries.

The 1982 pre-open enrollment activities included a mailing to 45,000 potential enrollees in mid-March, newspaper advertising before and after the mailing, and 45 group presentations. There was no newspaper or television advertising during open enrollment itself, however some advertisements of both kinds appeared May 31. The campaign generated a membership increase of 780.

In mid-summer 1982, SHARE conducted an "expansion campaign" with some of the same elements that had been previously employed -- a mailing to 100,000 senior citizens, two newspaper and two radio advertisements, 35 group presentations, plus a segment on the popular "Over Easy" talk show. The membership increase made the efforts worthwhile, as 2,043 enrollees were added during June, July, and August.

The final campaign of 1982 was conducted from September through December, during which a mailing was sent to 50,000 elderly people and was supplemented with radio advertisements and 25 group presentations. During this period, 1,800 enrollments were processed, yielding a year-end membership of 13,200.

In addition to its membership recruitment activities, SHARE devoted a considerable amount of attention to ensuring the provision of high-quality medical care and maintaining good relations among its senior citizen members. For example, SHARE hosted an appreciation luncheon for those Senior Care members who had volunteered to serve on an advisory committee. A regular Senior Care newsletter was (and still is) published to keep seniors informed of important issues related to their medical care.

A number of causes can be cited as explanation of SHARE's success in recruiting new members. First of all, SHARE advertised itself as "A Plan that Cares" and tried to convey the impression that members were viewed as an integral part of the Plan rather than just patients. As a result of SHARE's efforts to make the seniors feel welcome and wanted, members were very eager to spread the word to their friends. One SHARE marketing representative has noted that a significant number of members joined simply on the basis of their friends' referrals.

Another reason for SHARE's success in marketing is that the Plan was willing to commit a significant portion of its human and financial resources to increasing the Senior Care membership. In the period from August 1980 to August 1982, SHARE spent $665,000 on advertising and related expenses to enroll 8,927 beneficiaries, yielding an average marketing cost of $74.50 per person. Also, the Plan did not establish a ceiling on its enrollment goal, so there was no concern that enrollment might exceed capacity should a marketing campaign be particularly successful. At the end of 1982, SHARE had about 13,300 Senior Care enrollees, comprising more than 20 percent of the total Plan population and accounting for half of the Plan's total growth to that point. In sum, it appears that SHARE's strong commitment to making the Senior Care program successful paid off in the form of enrolling a large number of satisfied members.

By the end of December 1982, the number of Medicare enrollees in SHARE was 13,227. Of the Twin Cities membership (i.e. excluding their out-state memberships in the Iron Range), 11,447 were in SHARE's high option plan and 221 members were in their basic option plan. This represents an increase of 114% over 1981 figures.

SHARE 1983

In 1983, SHARE continued its aggressive marketing stance concerning the Medicare population. Their commitment to serving older people is evident in their liberal screening policies and their decision to continue participating beyond 1983. SHARE continues to be the most aggressive marketer of the four plans in the Medicare demonstration project. SHARE has a large number of Medicare members, and longer term experience in handling them. Members' integration into the program has become routine, with a minimum number of problems. SHARE continues to have the advantage of a very large number of members who actively "spread the word" about how much "SHARE cares".

MEDCENTER Health Plan:

The oldest of the participating Twin Cities HMOs, MedCenter, was formed in 1972 by the St. Louis Park Medical Center, an established multispecialty group practice in suburban Minneapolis. Services are provided at the main clinic facility, five St. LLouis Park satellite clinics, and eight contracted physician groups throughout the metropolitan area. There are approximately 150 participating physicians, two-thirds of whom are affiliated directly with the St. Louis Park Medical Center. The majority of hospital treatment is provided contractually through Methodist Hospital, located near the Center, but three other hospitals also contract to receive MedCenter patients.

The Plan had an enrollment of 44,000 in 1978. Although MedCenter had no Medicare contracts, many of the MedCenter physicians were accustomed to serving this population by having them as patients in their fee-for-service practices. MedCenter physicians had treated a substantial number of elderly patients at the St. Louis Park Medical Center, and the Plan had been offering a supplemental policy to employed members who "aged in".

MedCenter wanted to participate because it was convinced it could keep costs low enough to make participation advantageous. MedCenter Health Plan devised health questionnaires which were mailed to new enrollees. Those persons were then contacted by phone and appointments were set up.

MedCenter Health Plan also organized a Senior Health Services Department which served as the coordinating unit for the entrance of the elderly into the health plan. The department was staffed by nurse practitioners, a social worker, and a receptionist, as well as by primary care physicians (both internists and family practitioners) interested in care of the elderly. The enrolled beneficiaries used this clinic as their entry point to the health plan, although they might subsequently be referred to other physicians and services on the basis of their specialized needs. The department conducted a morning clinic for acute and chronic problems, and served as the resource for telephone questions about illness, health maintenance, or other problems. The nurse practitioners who staffed this department also visited the patients in the nursing home and at home. The full-time social worker identified and coordinated resources in the community, and also assisted senior health service patients with admission and discharge planning. MedCenter made consistent gains in membership after the establishment of the Senior Health Services Department.

MedCenter Health Plan held orientation meetings on a monthly basis and found that they were well attended by new enrollees, and well received. Such a session allowed the plan to supplement written material with verbal and audio visual information on clinic procedures, coverage, billing, appropriate use of the emergency room, and selection of a primary care physician. MedCenter's orientation sessions also included a blood pressure check to enable prompt referral of high-risk patients for treatment. Such meetings appear to have improved the appropriate utilization of outpatient and emergency services. MedCenter Health Plan has developed three health education programs that have proven particularly useful:

- Ease of Aging: This popular program, a weekly support group for patients, is facilitated by a social worker and a psychologist. The group discusses coping with aging, stress, loneliness, role changes, community resources, health issues, and risk factors.

- Aging, A Family Concern: Offered in the evening, this program is aimed at elderly enrollees and their families. A nurse practitioner and social worker facilitate the course and help the elderly and their families deal with the myths of aging, normal vs. abnormal aging, problems with aging, and community resources. This course also allows the patients and their families time to talk with physicians on a personal basis.

- Exercise for the Elderly: This community-based program is being designed for and led by the elderly themselves; the plan hopes that it may serve as a model for future program efforts.

MedCenter 1981:

MedCenter experimented with several marketing approaches during 1981, including:

- direct mail campaigns
- newspaper ads
- community group meetings
- testing various advertising agencies

MedCenter reports that inquiries about its program increased by 300% the week following the appearance of full-page MedCenter Medicare ads in two local newspapers. MedCenter has also established relationships with local senior organizations and senior leaders in the community. While MedCenter's senior enrollment started out very slowly, there has been a steady increase in their total enrollment.

MedCenter's Senior Health Assurance Plan experienced the most consistent growth of all the plans, as it slowly but steadily acquired the second largest senior citizen enrollment. Membership growth might have been even faster, except that MedCenter restricted its marketing so that it would not attract excessive numbers of high-cost patients. Because MedCenter is affiliated with St. Louis Park Medical Center, which is known for its excellent oncology services, MedCenter feared that extensive advertising of the link with the Medical Center would attract those who were in greatest need of these services. Later in 1981, however, this posture was revised, as the demand for oncology care never materialized. Instead, MedCenter attempted to play up its affiliation with the Medical Center as being one of the Plan's strong points.

MedCenter was unique among the four plans in that it created and staffed a department to attend to the special needs of the seniors. The Senior Health Services group is comprised of nurse practitioners, a social worker, and an overall Senior Care coordinator. This format allows centralization in the provision of services to senior citizens, and makes it possible to be responsive to their needs and concerns.

MedCenter's 1981 activities were not unlike those adopted by the other HMOs, as they included a combination of various mass media approaches and more personalized presentations. On April 29, 1981, MedCenter ran an advertisement in the Sunday newspapers in conjunction with Nicollet-Eitel, yielding 1,400 responses. Radio announcements were also used preceding and during the open enrollment period. A rather unique mass mailing approach was taken by MedCenter, as it purchased a list of 7,000 members of the AARP (American Association of Retired Persons). Flyers were mailed to the 200 individuals in this group who requested information, and to anyone who had previously inquired about the program but had never applied.

MedCenter also attempted to inform potential enrollees by inserting a flyer in the newsletter sent to all Plan members. This method, however, generated only one percent response. Senior Health Assurance (SHAP) staff members also made a number of presentations to individuals residing in the various MedCenter service areas. They often took a clinical staff member with them to answer any medical questions as they arose, or simply to enhance their credibility. The SHAP staff also conducted very successful new member orientation sessions, which were attended by approximately 40 percent of new members. Although the sessions were not designed as a marketing technique, they could well have been an attractive feature for those considering joining.

MedCenter 1982:

The 1982 approach was fairly similar to the one taken in 1981. Several different newspaper advertisements were placed in major metropolitan Sunday editions, senior newsletter, Metropolitan Senior Federation (MSF) newsletters, and the local television guide. A feature unique to the 1982 marketing campaign was the premium discount offered to MSF members. Since MedCenter had received MSF's endorsement, it seemed worthwhile to offer MSF members a reduced price as they would be more likely to think about joining with MSF's backing.

Another change in 1982 was that MedCenter eliminated the drug option, thus allowing a reduction in premiums. Finally, one factor affecting MedCenter's reputation among potential enrollees was the expanded word-of-mouth advertising initiated by satisfied enrollees. As more and more members joined and had occasion to use MedCenter's services, the word traveled among the senior

population that the HMO option was a good way to receive medical care. They added a marketing representative, decided to be more aggressive in their marketing attitudes, and felt that MedCenter offered unique services, such as their own senior health service program. They added to their staff a nurse practitioner, a geriatric physician, and a social worker (who deals strictly with their senior health problems).

In terms of enrollment, MedCenter's December 1982 membership figures included 1,310 members in the high-option plan with drug coverage, and 566 in high-option without drug coverage. Enrollment in the low-option plan was 236, for a total 2,112. The growth of the MedCenter Medicare population in 1982 was 205 percent. Since at this point Medicare enrollees comprised only 2 percent of MedCenter's total membership, the staff set a goal for growth at 12-15 percent per year.

MedCenter 1983:

MedCenter's senior health services section expanded in 1983. They opened a section in Hopkins. They stressed health education and wellness for their seniors. They also offered a very serious orientation for the seniors who joined their HMOs; they felt that in this way they had had fewer problems in integrating their seniors. They felt that the general education level (i.e., of the seniors in connection with HMO offerings) was much higher now in all their members, and potential members as well. In addition to the original orientation, MedCenter continued education of their senior members as to how to use their plan effectively and efficiently.[1]

[1]NOTE: In mid-1983 MedCenter and Nicollet-Eitel finalized merger agreements. During 1983-1984 they will transfer contracts as they come due and eventually will merge their two demonstration contracts.

HMO Minnesota "Medicare and More":

HMO Minnesota (HMOM) is an affiliate of Blue Cross/Blue Shield of Minnesota, governed through a management agreement. A separate administrative unit has been established within Blue Cross/Blue Shield to manage the Health Plan. HMOM is a network HMO, with more than 1,000 physicians participating (although not all are participating in the Medicare demonstration). The independent physician groups contracting with HMOM share in the hospital and medical risks of providing care to the enrollees and are reimbursed on either a prepaid or fee-for-service basis with a year-end settlement to determine physician liability. After opening in September 1974, HMOM experienced slow growth through its first two years.

HMO Minnesota approached the Medicare project reluctantly, as it was fearful of assuming full risk and had many physician members who were opposed to the program. HMOM was particularly opposed to HCFA's forced benefit design, and was reluctant to take on added administrative responsibilities. Although HMOM did eventually consent to participation on a limited basis, it felt that HCFA's imposed structure was contrary to competition, encouraged anti-selection, and would be a disservice to senior citizens. HMOM physicians had worked with senior citizens in their individual practices, but the organization lacked any administrative experience with this population.

HMO 1981:

Marketing efforts began very slowly. Some HMO Minnesota physicians, characterized by InterStudy in its annual report as "the primary marketing agents in the network model HMO", were reportedly advising their patients, when asked about the HMO, not to join the plan. The HMO did begin to more actively market its option during 1981 and marketing materials were presented to senior groups.

HMOM's marketing efforts were hampered by internal administrative and organization problems, as the Plan was not fully prepared to handle the responsibilities involved in serving the Medicare population. Because of several internal management changes, HMOM had not made full provision for the

program at the start of the demonstration project. Another negative influence on HMOM's marketing efforts was the very stringent health screening employed. Since only 10 percent of all applicants applying for high option were actually approved, it was undoubtedly difficult for the marketing representatives to recruit applicants when it was likely that they would be turned down anyway. Also, one consequence of the low acceptance rate was that the Metropolitan Senior Federation would not offer its endorsement to HMOM's Medicare and More program. HMOM's 10 percent rate was so low that it caused some backlash from leaders in the senior citizen community.

The fact that individual physicians were contractually obligated to assume the risk of caring for patients made many reluctant about taking on the Medicare population. A fair number of physicians were outspoken about opposing the program, asserting that it would result in unacceptably low quality of care. In view of this opposition, HMOM administrators concluded that it would be inappropriate and politically unwise to initiate an intensive marketing campaign. As a matter of fact, some HMOM physicians were incensed that the organization committed itself to participating in the Medicare and More program in the first place as they felt that they, and not HMOM, would be shouldering the greatest risk.

In spite of these limitations, HMOM did initiate some marketing activities prior to the first open enrollment period. Eight advertisements appeared in St. Paul/Minneapolis newspapers during a two-week period in March and April of 1981. Seven community presentions were made to 160 attendees, and 20 telephone lines were established to handle requests for information. All told, 1,551 calls and 52 written request were received; each person who called or wrote was sent an information packet detailing the program. The outcome of this effort was favorable in that 1,032 applications were received, but only 269 members were accepted after stringent health screening had taken place.

Since HMOM did not want to actively market during open enrollment for fear that it would attract too many unhealthy members, the second major marketing campaign was only initiated in November and December of 1981. The components of this effort were similar to the first marketing initiative, with newspaper advertising being the primary mass media approach. During this two-month

period, eight advertisements appeared in the television section of major Sunday newspapers, as well as 30 in small suburban papers, bulletins, and other print media. Some of the newspaper advertisements were made into posters, which were then distributed to physicians' offices for display. As in the previous campaign, the telephone line was employed to handle incoming information requests. Between August and December of 1981, 350 applications were received, but due to the stringency of the health screen, enrollment as of December 31 was only 455.

HMOM 1982:

Activities in the third marketing campaign were comparable to those of the previous two initiatives. In July of 1982, 15 advertisements were placed in area newspapers -- four appeared in Sunday editions, nine advertisements (with coupon) were placed in weekday editions, and two appeared in the MSF (Minnesota Senior Federation) newsletter. In addition, HMOM placed advertising in MSF's yellow pages. Eleven group meetings were conducted, and the telephone line was manned, with a total of 775 calls being received.

The last and most extensive of HMOM's campaigns occurred from December 1982 to January 1983. By this time, HMOM had made the necessary administrative changes to accommodate the Medicare and More program, so the Plan was willing to pursue potential enrollees in a more aggressive fashion. One indication of this revised position was HMOM's mass mailing to 27,000 senior citizens. Another major change was HMOM's extensive use of radio advertising. A well-respected, older radio personality was hired as spokesman for HMOM's Medicare and More, and the commercials were aired between 60 to 90 times a week for six weeks. The commercials encouraged listeners to call HMOM to find out if their doctors were participating, since HMOM wanted to play up the fact that many enrollees would be able to continue seeing their own physicians. A further emphasis in the commercials concerned the price, since HMOM had reduced its premium from the previous year, and wanted listeners to know that its prices were lower than SHARE's.

Additional activities during the December/January advertisement campaign included placing 33 newspaper advertisements, displaying posters in bus shelters, and making presentations to groups of specially invited patients at

medical clinics. More than 2,000 application packets were mailed out in response to inquires; however it is not known how many memberships resulted from this group. Due to the manner in which marketing expenditures were recorded, it is also difficult to ascertain the exact marketing costs. It is known, however, that the member per month allocation for advertising was $72.00.

By April 1, 1982, HMO Minnesota had a total senior enrollment of 543, but had screened out 1,006 applicants. The impact of the high option screening permitted at the Twin Cities sites is perhaps most clearly felt at HMOM. It reported that a vast majority of applicants to this option had been rejected based on their health screens. This rejection rate decreased in later months.

In 1982, HMOM continued to operate from an extremely conservative stance. They proceeded into this arena very slowly because they felt it was a totally unknown area, particularly with regard to the risks involved in this age group. They continued to screen very closely and to monitor the use of the plan.

By the end of 1982, HMOM had 658 members; of these, 77 were low option and 563 were high option. This represented an increase of 18 percent.

HMOM 1983:
HMOM revised its conservative approach in late 1982 and experienced substantial growth during the first six months of 1983.

Nicollet-Eitel Health Plan:

Nicollet-Eitel Health Plan is a group HMO with over 20,000 enrollees, less than 100 of whom were over age 65 prior to the current demonstration project. The health plan is jointly sponsored by the Nicollet Clinic and Eitel Hospital, both located in Minneapolis. The Nicollet Clinic, a multi-specialty group practice, has a staff of 50 physicians at four sites in the western metropolitan area. Eitel Hospital is a 145-bed general acute hospital with 140 physicians on its medical staff. The Plan is also affiliated with

Fairview-Southdale Hospital and with other physicians in specialties and sub-specialties not otherwise available within the clinic. Nicollet-Eitel Health Plan was not a federally qualified HMO.

Prior to joining the HMO/Medicare Project, Nicollet-Eitel had featured health plans sponsored by the Metropolitan Senior Federation and offered services to the elderly through the well-established Nicollet Clinic. Similarly, Nicollet-Eitel felt that serving senior citizens would be desirable both for financial reasons and for public relations purposes.

NEHP 1981-1982:

Marketing efforts at Nicollet-Eitel began slowly, and in a fashion similar to those of MedCenter. The first mailing was sent to 5,000 clients of the Nicollet clinic, the HMO's primary outpatient facility. Nicollet-Eitel found that the first mailing was disappointing, but that a follow-up mailing was more successful. Further marketing efforts concentrated on personal presentations to seniors at senior centers and senior high-rise housing units. Nicollet-Eitel experienced a steady increase from its early low senior enrollment, and by April 1, 1982 Senior Plan enrollment was 773.

By and large, Nicollet-Eitel's marketing approach was fairly similar to MedCenter's. A full-time marketing representative was hired to coordinate the activities, which included establishing contacts with various senior citizen organizations. Due to a limited marketing budget, a relatively small amount of advertising was purchased.

The 1981 marketing campaign was initiated with a mailing to 6,000 existing Nicollet-Eitel patients. A follow-up mailing was then conducted later in the year, with a resulting membership increase of 600. Nicollet-Eitel also placed informational inserts into bills sent to their older fee-for-service patients. Similarly, Senior Health Plan information racks were placed in the clinics to alert patients who were already making use of Nicollet-Eitel facilities. The Metropolitan Senior Federation offered its endorsement to Nicollet-Eitel in 1982; subsequently, the Plan placed several advertisements in the MSF newsletter. A newspaper advertisement in which MedCenter and Nicollet-Eitel collaborated on prompted a substantial number of inquiries from potential enrollees.

Nicollet-Eitel's enrollment results were combined for the years 1981 and 1982, so it was not possible to assess the relative effects of the different marketing tactics; however, the cumulative results are as follows:

- 8,000 information packets distributed;
- 1,650 completed applications returned;
- 300 not accepted for high-option;
- 107 of those rejected for high-option enrolled in low-option;
- 1,093 enrolled as of December 1982, accounting for 5% of Nicollet-Eitel's 30,000 members.

During 1982, Nicollet-Eitel continued to approach the community in much the same way that it had in 1981. They did their promotional work in high-rises, the United Way funded organizations, congregational dining areas, and other types of community outreach. The Senior Federation endorsed Nicollet-Eitel during 1982.

Nicollet-Eitel's enrollment as of December 31, 1982 was 1,067. Of these, 785 were in the high option program and 282 were in the low option. This represents a 49 percent growth from the year before.

The Senior Federation endorsement of Nicollet-Eitel did not produce the kind of membership increase which might have been expected. Nicollet-Eitel did some newspaper advertising. Part of their marketing emphasis for the end of 1982 was in contacting their current client accounts with some questions about the retirees which they are presently supporting in some way.

Because Nicollet-Eitel Health Plan was connected with the Nicollet Clinic, and this was a facility which has been serving seniors for many years, no major adaptations were made during 1982 to facilitate the integration of the senior population.

NEHP 1983:

In mid-1983 NEHP and MedCenter Health Plan began and finalized merger agreements. The ultimate goal is to merge their two demonstration contracts.Nicollet-Eitel, perhaps constrained by the prospect of its impending merger with MedCenter, did not experience great increases in enrollment at any stage in the demonstration. Part of the explanation for the limited growth, however, would have to be related to the overall size of Nicollet-Eitel; as the smallest of the four plans, it is not surprising that growth in the senior enrollment would be less substantial than that of the other HMOs.

APPENDICES

APPENDIX 1

Reasons for Applying to An HMO

	N	Adjusted Percent
Benefits are attractive	217	64.0
Hospital and clinics are convenient	217	64.0
Premium is low	177	52.2
My physician is in an HMO	138	40.7
Friends and family encouraged me to join	56	16.5
I've always wanted to join an HMO	43	12.7
Not eligible for other health insurance	17	5.0
My physician encouraged me to join	17	5.0
I was in an HMO before I retired	12	3.5
Other*	27	8.0
No applicable or no answer (not included in percents)	(680)	--
	1601+	271.6++

\+ The total N is greater than 1019 because this is a multiple response question.

++ The percents are based on 339 valid respondents

* Other write-ins include: dissatisfied with current insurance, no paperwork, good program, no current doctor.

Source: 1981 Annual report, "A Medicare Multiple Choice Program for Minneapolis and Saint Paul", Interstudy.

APPENDIX 2

Twin Cities HMO Enrollment Survey

If you have not applied to become a member of an HMO, what were your reasons for not applying?

Response (multiple)	N.	Adjusted Percent
Physician is not in an HMO	249	37.8
HMO clinic facilities not convenient	142	21.6
Supplemental insurance is paid	130	19.7
Program is experimental	129	19.6
My hospital not affiliated with HMO	127	19.3
Premiums are too high	105	16.0
Spend time away from Twin Cities	90	13.8
Benefits are unattractive	85	12.9
The program is too confusing	76	11.5
Concerned that premium will increase	70	10.6
Other (not eligible, need information, need to study program, like to choose doctor, don't think I can get in, spouse not eligible, not interested)	134	20.4
Not applicable or no answer	(361)	—
1019 - 361 = 658 valid respondents	1337	182.8

Source: 1981 Annual Report, "A Medicare Mutliple Choice Program for Minneapolis and Saint Paul", InterStudy.

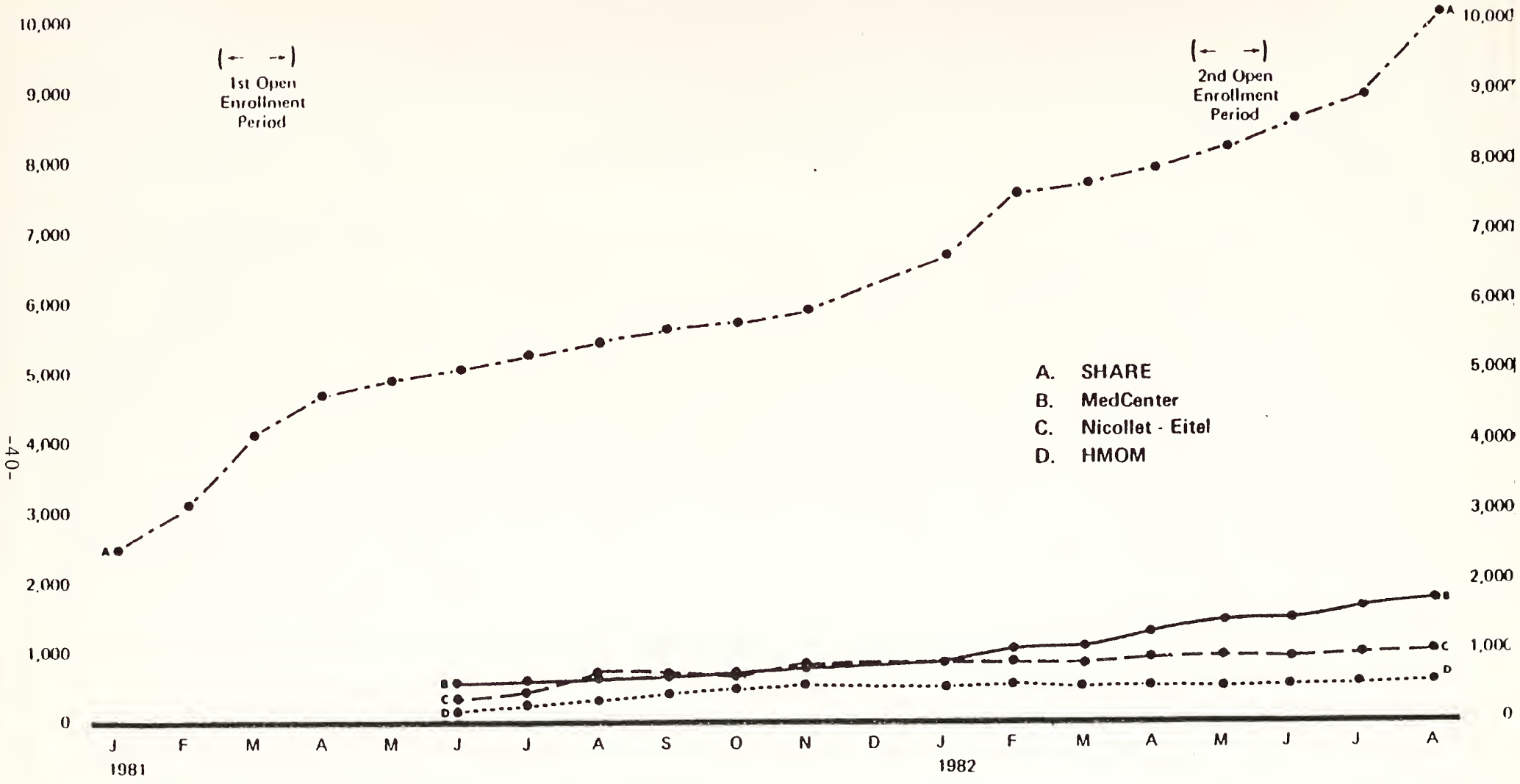
APPENDIX 3

PROSPECTIVE CAPITATION DEMONSTRATIONS*

1980 - 1981

HMO Name	1980 Enrollment	As a % of Total Total HMO Members	As a % of Total Medicare Pop. in Area	1981 Enrollment	As a % of Total HMO Members	As a % of Total Medicare Pop. in Area
Share Health Plan Minneapolis, MN	425	1.3%	.2%	5812	13.2%	2.8%
MedCenter Health Plan Minneapolis, MN	--	--	--	671	.7%	.3%
HMO Minnesota St. Paul	--	--	--	470	.9%	.2%
Nicollet-Eitel Health Plan Minneapolis, MN	--	--	--	676	3.0%	.3%

SOURCE: HMO Industry Report Series: Volume Four: Medicare Enrollment in HMOs, 1981. Jean Hetherington, JD., MPH, InterStudy, April, 1982, p. 11.



Enrollment Growth Pattern for Minnesota Demonstrations

SOURCE: Summary of Observations Medicare/HMO Demonstration Project, by H. A. Kahn and R. E. Leighton, 1983, p. 27.

APPENDIX 5

DEMONSTRATION SITE CHARACTERISTICS

Site (1)	Area Population			Total HMO Members (5)	Federally Qualified (6)	Previous Medicare Experience? (7)	HMO Type (8)	Affiliations (9)
	Total (2)	Medicare (3)	Medicare (4)					
InterStudy	1,940,000	200,000	10%	250,000				
a) HMOM				68,000	No	No	Network	BC of Minn.
b) MedCenter				80,000	No	No	Group	
c) Nicollet-Eitel				20,000	No	No	Group	
d) SHARE				40,000	Yes	Yes-Cost Contract	Mixed	

Source: Demonstration protocols, interviews with HMO representatives. Statistics characterize sites as of the inception of the demonstrations at each site, 1980.

From: Summary of Observations Medicare/HMO Demonstration Project, by H. A. Kahn & R. E. Leighton, 1983, p.14

APPENDIX 6

Cost and Utilization Statistics
For Three Minnesota HMOs

Statistics (1)	HMOM (2)	MedCenter (3)	Nicollet-Eitel (4)
1. 1981 member-months	1,640	3,605	3,493
2. Health care expense			
a) Amount	$260,199	$310,480	$350,999
b) Per member-month	158.61	86.12	100.49
3. Inpatient utilization			
a) No. of discharges	45	49	74
b) Total inpatient days	382	375	672
c) Average stay	8.5	7.7	9.1
d) Days/1,000 member-year	2,171	1,248	2,309
4. Ambulatory encounters			
a) Number	897	1,700	2,126
b) Per member-year	5,099	5,659	7,304

Sources: (1) Annual Report to the Commissioner of Health, State of Minnesota, 1981 (Note: SHARE did not report).

(2) Member months taken from InterStudy's "Annual Report, 1981", March, 1982.

The four demonstration HMOs in the Minneapolis-St. Paul area did not need to submit rate proposals to HCFA, nor have detailed cost reports been supplied by these HMOs. The only utilization and cost statistics currently available to the evaluation team are those based on reports that HMOs in the State of Minnesota are required to make to the State Commissioner of Health. The paper presents statistics developed from the 1981 Annual Report submitted by HMOM, MedCenter, and Nicollet-Eitel. (SHARE did not report statistics for the demonstration enrollees separately from other SHARE members, and through agreement with the Minnesota Department of Health will not submit them until late 1983.)

SOURCE: Summary of Observations Medicare/HMO Demonstration Project, by Howard A. Kahn and Rigby E. Leighton, Jurgovan and Blair, Inc., March 1983, p.69.

APPENDIX 7

Beneficiary Premiums

HMO (1)	1980		1981		1982	
	Amount (2)	% Total Cost (3)	Amount (4)	% Total Cost (5)	Amount (6)	% Total Cost (7)
4. Minnesota - low options						
a) HMOM	-	-	21.75	14.0%	27.50	16.6%
b) MedCenter	-	-	15.75	10.5%	16.95	10.9%
c) Nicollet-Eitel	-	-	12.50	8.5%	12.50	7.8%
d) SHARE	-	-	13.95	9.4%	18.75	11.7%
5. Minnesota - high options						
a) HMOM	-	-	22.85	14.6%	22.85	14.2%
b) MedCenter	-	-	27.75	17.1%	27.75	16.6%
c) Nicollet-Eitel	-	-	16.55	11.0%	16.55	10.1%
d) SHARE	-	-	14.95	10.0%	19.75	12.2%

NOTE: For Minnesota HMOs, total cost is assumed to equal the HCFA capitation plus the beneficiary premium.

SOURCE: Summary of Observations Medicare/HMO Demonstration Project, by Howard A. Kahn and Rigby E. Leighton, Jurgovan and Blair, Inc., March 1983, p. 55.

APPENDIX 8

TWIN CITIES MEDICARE DEMONSTRATION ENROLLMENT

	SHARE	MedCenter	Nicollet-Eitel	HMO Minnesota
11/80	424	--	--	--
12/80	1,941	--	--	--
1/81	2,516	--	--	--
2/81	3,063	--	--	--
3/81	4,091	--	--	--
4/81	4,706	53	--	--
5/81 (first open enrollment)	4,816	212	114	55
6/81	5,073	504	384	147
7/81	5,157	579	473	269
8/81	5,269	602	633	387
9/81	5,445	638	665	459
10/81	5,727	684	686	517
11/81	5,834	719	723	525
12/81	6,181	771	728	558
1/82	6,723	907	729	559
2/82	7,662	1,007	747	565
3/82	7,821	1,090	773	543
4/82	7,973	1,247	810	553
5/82	8,172	1,420	861	573
6/82	8,402	1,596	931	589
7/82	8,954	1,764	981	589
8/82	10,081	1,877	1,018	592
9/82	10,850	2,038	1,034	609
10/82	10,849	2,130	1,055	631
11/82	12,559	2,230	1,078	641
12/82	13,227	2,354	1,088	658
1/83	13,894	2,542	1,098	663
2/83	14,659	2,699	1,131	967
3/83	15,576	2,907	1,181	1,452
4/83	16,605	3,172	1,218	1,789
5/83	17,250	3,464	1,266	1,983
6/83	18,045	3,661	1,286	2,097
7/83	18,636	3,829	1,293	2,164
8/83	19,092	4,064	1,273	2,291
9/83	19,431	4,191	1,278	2,453
10/83	19,871	4,393	1,262	2,585
11/83	20,407	5,889	1,268	2,750
Average Monthly Increase:	566	143	43	83
Net:	14,386	4,011	1,159	2,236

APPENDIX 9

Summary of Demonstration Site Enrollment Statistics

Demonstration Site	Project Start Date	Membership as of July '82 Total	Medicare Demo	% in Demo	Demo Members as % of Area Medicare
Minnesota					
a) HMOM	May '81	68,000	589	1%	
b) MedCenter	May '81	80,000	1,764	2%	8%
c) Nicollet-Eitel	May '81	21,500	981	5%	
d) SHARE	Dec '80	40,000	8,954	22%	

SOURCE: Summary of Observations Medicare/HMO Demonstration Project, by Howard A. Kahn and Rigby E. Leighton, Jurgovan and Blair, Inc., March 1983, p. 46.

APPENDIX 10

APC/AAPCC Values for Demonstration Sites

(1)	APC/AAPCC 1980 (2)	1981 (3)	1982 (4)	1983 (5)
Minnesota				
a) HMOM	-	141.16*	138.00	-
b) MedCenter	-	141.16*	139.00	-
c) Nicollet-Eitel	-	141.16*	147.00	-
d) SHARE	-	141.16*	142.00	-

*APC values; others are AAPCC

SOURCE: Summary of Observations Medicare/HMO Demonstration Project, by Howard A. Kahn and Rigby E. Leighton, Jurgovan and Blair, Inc., March 1983, p. 49.

APPENDIX 11

MEDICARE CAPITATION DEMONSTRATIONS OPEN ENROLLMENT PERIOD*
PROJECTIONS AND ACTUAL ENROLLMENTS

1981

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

InterStudy:

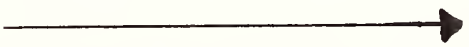
a. 3 groups, 1 IPA

b. Total Size:
HMOM (IPA): 68,000
MedCenter: 80,000
Nicollet: 21,500
SHARE: 40,000

1st Open Enrollment
(Low and High Options)

c. Previous Medicare Enrollment:
HMOM: None
MedCenter: None
Nicollet: None
SHARE: Previous cost contract now under present Demo.

- Marketing Began
- Applications Accepted
- Expected Enrollee's First Effective Date



d. Projected Medicare enrollment under Demo.
HMOM: None
MedCenter: Stop at 5,000
Nicollet: None
SHARE: Stop at 10,000

Open Enrollment Continuous
High Option Plans Only

(Admittance to this plan is subject to health screening based on past medical histories

e. Medicare Enrollment to Date:
HMOM: No breakdown as yet
MedCenter: Plans will not release
Nicollet: data. Approx. 1,300
SHARE: app. were received.

f. Medicare Enrollment:
HMOM: None
MedCenter: None
Nicollet: None
SHARE: None

* Open Enrollment is defined as that period in which the HMO accepts individuals in order in which they apply for enrollment. We have interpreted this to mean when marketing began and applications were accepted.

Enrollees' First Effective Date is defined as the first date in which the Medicare enrollee was eligible to receive health benefits from the HMO.

SOURCE: Summary of Observations Medicare/HMO Demonstration Project, by Howard A. Kahn and Rigby E. Leighton, Jurgovan and Blair, Inc., March 1983, p. 45. Chart prepared by SysteMatics.

APPENDIX 12

COMPARISON OF BENEFIT PACKAGES FOR MEDICARE
BETWEEN STANDARD MEDICARE COVERAGE AND HMO DEMONSTRATIONS
1981

INTERSTUDY (High and Low Option Plans - Differences are Identified)				
	HMOM	MEDCENTER	NICOLLET-EITEL	SHARE
IN-PATIENT CARE	Low: Covered in full up to 90 days per benefit period, 60 day lifetime reserve. High: Covered in full 365 days/benefit period.	Low: Covered in full up to 90 days per benefit period, plus remaining lifetime reserve High: Covered in full 365 days/benefit period.	Low: Covered in full up to 90 days per benefit period, plus remaining lifetime reserve High: Covered in full 365 days/benefit period.	Low: Covered in full up to 90 days per benefit period, 60 day lifetime reserve. High: Covered in full - no limit
OUT-PATIENT CARE AND PHYSICIAN SERVICES				
Episodic	Covered in full - no limit	Covered in full - no limit	Covered in full - no limit	Covered in full - no limit
Lab and X-Ray	Covered in full - no limit	Covered in full - no limit	Covered in full - no limit	Covered in full - no limit
Emergency Care	At plan hospital—$15 unless admitted. At non-plan 20% of first $500.	At plan hospital—$15 unless admitted. At non-plan 20% of first $500.	At plan hospital—$15 unless admitted. At non-plan 20% of first $500.	At plan hospital—$10 unless admitted. At non-plan 20% of first $500.

INTERSTUDY (High and Low Option Plans - Differences are Identified)				
	HMOM	MEDCENTER	NICOLLET-EITEL	SHARE
Preventive 1. Physical Exam	Low: Not covered High: Covered in Full	Low: Not covered High: Covered in Full	Low: Not covered High: Covered in Full	Low: Not covered High: Covered in Full
2. Immunization	Low: Same as Medicare High: 100% of preventive immunization.	Low: Same as Medicare High: 100% of preventive immunization.	Limited to direct exposure to infectious diseases or injury.	100% of preventative immunization
3. Other	High: Hearing exams $10 copayment	High: Hearing exams	High: Hearing exams, allergy immunization.	High: hearing exams.
SKILLED NURSING CARE	Low: 1-day hospitalization required. Up to 100 days per benefit period. High: 365 days benefit period 1-day prior hospitalization.	Low: covered in full up to 100 days per benefit period. High: covered in full. 365 per benefit period.	Covered in full up to 100 days per benefit period.	Low: covered in full up to 100 days per benefit period. High: Covered in full 365 days/benefit period.
HOME HEALTH CARE	Covered up to 200 visits per benefit period. No prior hospitalization needed	Covered up to 200 visits per benefit period. No prior hospitalization needed.	Covered up to 200 visits per benefit period. No prior hospitalization needed.	Low: Up to 200 visits per benefit period. High: Up to 250 visits per benefit period. No prior hospitalization needed.

INTERSTUDY (High and Low Option Plans - Differences are Identified)				
	HMOM	MEDCENTER	NICOLLET-EITEL	SHARE
Preventive 1. Physical Exam	Low: Not covered High: Covered in Full	Low: Not covered High: Covered in Full	Low: Not covered High: Covered in Full	Low: Not covered High: Covered in Full
2. Immunization	Low: Same as Medicare High: 100% of preventive immunization.	Low: Same as Medicare High: 100% of preventive immunization.	Limited to direct exposure to infectious diseases or injury.	100% of preventative immunization
3. Other	High: Hearing exams $10 copayment	High: Hearing exams	High: Hearing exams, allergy immunization.	High: hearing exams.
SKILLED NURSING CARE	Low: 1-day hospitalization required. Up to 100 days per benefit period. High: 365 days benefit period 1-day prior hospitalization.	Low: covered in full up to 100 days per benefit period. High: covered in full. 365 per benefit period.	Covered in full up to 100 days per benefit period.	Low: covered in full up to 100 days per benefit period. High: Covered in full 365 days/benefit period.
HOME HEALTH CARE	Covered up to 200 visits per benefit period. No prior hospitalization needed needed.	Covered up to 200 visits per benefit period. No prior hospitalization needed.	Covered up to 200 visits per benefit period. No prior hospitalization needed.	Low: Up to 200 visits per benefit period. High: Up to 250 visits per benefit period. No prior hospitalization needed.

INTERSTUDY (High and Low Option Plans - Differences are Identified)				
	HMOM	MEDCENTER	NICOLLET-EITEL	SHARE
PRIVATE DUTY NURSING	High: covered in full during eligible hospital admission	Not covered	Not covered	Not covered
AMBULANCE	Covered in Full	Covered in Full	80% coverage	Covered in full
MENTAL HEALTH				
In-Patient	Covered up to 90 days per benefit period, 190 days in lifetime.	Covered up to 60 days in full, 61-90 days, $35/day, 190 days lifetime maximum.	Covered up to 190 days in a lifetime.	Low: Up to 60 days in full: 61-90 days @ $25/day, 90 days/benefit period. 190 days max. High: Up to 60 days in full. 61-90 days @ $11/day. 90 days/benefit period. 190 days max.
Out-Patient	Low: 80% covered up to $500 per year. High: 80% covered up to $1000 per year.	10 visits/year at $20 visit	7 visits/year at $10 per visit (20 visits for chemical dependency)	Low: up to 20 visits at $10/visit. High: Up to 20 visits at $5/visit.
PHYSICAL THERAPY	Covered in Full	Covered in Full	Covered in Full	Covered in Full

INTERSTUDY (High and Low Option Plans - Differences are Identified)				
	HMOM	MEDCENTER	NICOLLET-ETTEL	SHARE
RADIATION THERAPY	Covered in Full	Covered in Full	Covered in Full	Covered in Full
HEMODIALYSIS SERVICES	Not Covered	Not Covered	Not Covered	Not Covered
PRESCRIPTION DRUGS	Not Covered	Covered with $3.50 per prescription.	Not Covered	Not Covered
EYE EXAM	Low: Not covered High: covered—$15 co-payment	Low: Not covered High: covered in full	Low: Not covered High: covered in full	Low: Not covered High: covered in full
EYE GLASSES	Coverage only for lenses for post-cataract surgery patients.	Coverage only for lenses for post-cataract surgery patients.	Coverage only for lenses for post-cataract surgery patients.	Coverage only for lenses for post-cataract surgery patients.
PROSTHETIC DEVICES AND DURABLE MEDICAL EQUIPMENT	Covered in Full	Covered in Full	80 % Covered	Covered in Full
DENTAL CARE	Covered only for surgery of the jaw and related structures	Covered only for surgery of the jaw and related structures	Covered only for surgery of the jaw and related structures	Covered only for surgery of the jaw and related structures

INTERSTUDY (High and Low Option Plans - Differences are Identified)				
	HMOM	MEDCENTER	NICOLLET-EITEL	SHARE
CHIROPRACTIC SERVICES	Only coverage for manipulation of spine to correct subluxation when done at clinic.	Only coverage for manipulation of spine to correct subluxation when done at clinic.	Only coverage for manipulation of spine to correct subluxation when done at clinic.	Only coverage for manipulation of spine to correct subluxation when done at clinic.
PODIATRIST SERVICES	Coverage except for routine foot care & supportive devices.	Coverage except for routine foot care & supportive devices.	Coverage except for routine foot care & supportive devices.	Low: Coverage except for routine foot care and supportive devices. High: covered in full
MONTHLY PREMIUM CHARGES FOR ENROLLEES	Low: $21.75 High: $22.85	Low: $15.75 High: $27.75	Low: $12.50 High: $16.55	Low: $13.95 High: $14.95

SOURCE: Summary of Observations Medicare/HMO Demonstration Project, by Howard A. Kahn and Rigby E. Leighton, Jurgovan and Blair, Inc., March 1983, pps. 43-44.

SECTION V

HOSPITAL RESOURCE ALLOCATION FOR DECEDENTS AND SURVIVORS OVER 65

Introduction

In the 1980s, the foremost health policy question is how to contain the escalating cost of health care. Cost of health care for the elderly is identified as contributing greatly to that association. The combination of increasing numbers of elderly and increasing costs of health care are resulting in predictions that by 1990 the Medicare fund will be bankrupt. A major drain on that system are persons who are in their last year of life. Lubitz and Prihoda found in their national study, "Use and Costs of Medicare Services in the Last Year of Life," that "...decedents in their last year of life comprise 5.2% of Medicare enrollment, but they account for fully 28.2% of program expenditures..."[1] A large part of the expenditures for the decedents was hospital care.[2]

One of the difficulties in finding a solution to the Medicare fiscal crisis is the lack of explicit public policy about distribution of resources to elderly persons who are dying. The previously cited reference to the large proportion of Medicare expenditures going to this population implies a willingness to expend large numbers of health care dollars on dying patients. One step in evolving a public policy to allocate this money is to determine what is actually occurring in the health care setting (hospitals) which can be helpful in developing public policy which will contain cost without jeopardizing high quality care.

Physicians are trained and responsible for the greatest allocation of health resources, which involves hospital care. Two general considerations guide the process: 1) sanctity of life which implies the physician should attempt to prolong life as long as medically possible, and 2) humanitarian treatment which implies the physician should alleviate and prevent suffering.[3]

Since current technology makes it possible to maintain signs associated with life such as respiration and heartbeat, Cassen has proposed that the patient's medical condition and the family's wishes may suggest that an ethical course is to discontinue therapy.[4] Blum, in his study of physicians' attitudes toward critical care decision making, found that 65% of the physicians would override the patient's wishes if they felt it was "in the patient's best interest" or the patient was unable to decide. Blum found a similar willingness to override the family's wishes, but physicians expressed the attitude that in most situations the patient's and family's wishes should be followed.[5]

At times, physicians may experience role conflict[6] in balancing the values of sanctity of life and humanitarian treatment along with efficient use of resources. Not all physicians perform their resource allocator role in the same manner, so that dying persons 65 and over differ in the amount of resources they receive. In a study of seven internists in the same group practice, Lyle et al. found that in spite of no major difference in patient population, the difference in per capita cost of hospital and office care was almost 100%.[7] Physician differences in resource allocation may have contributed to the finding that in 1976, 9.1 percent of Medicare decedents required no Medicare reimbursement while 2.4 percent required at least $15,000 with a mode between $2,000 and $4,999.[8]

Data on utilization of health services suggest 1) if levels of utilization at the highest level were reduced to the lowest level, money could be saved, and 2) excess utilization is not necessarily associated with any apparent increase in quality of care or patient outcomes while being associated with increased charges. For example, Kincaid reports these average lengths of stay for persons 65 and over for the four national geographic regions: West, 9.3 days, South 10.5, North Central 12.1, and Northeast 14.1. Kincaid estimates that $48,026,000 could have been saved in 1976 if patients of all ages had been hospitalized at the rate of patients in the West.[9]

Garg et al.,[10] Schroeder et al.,[11] and Daniels and Schroeder[12] address the relationship between quality of care and utilization of health resources. Garg et al., using a process measure of quality, found for a similar diagnostic group of patients no significant difference in quality, while finding

variations in number of days hospitalized and charges. Schroeder et al. had faculty rate interns on the quality of care they gave a group of similarly diagnosed patients. These ratings were analyzed in relationship to laboratory utilization for which no significant correlation was found to the quality ratings, but the number of unnecessary tests was strongly correlated with costs. Using the outcome measure of specific blood pressure levels, Daniels and Schroeder report a negative but non-significant relationship between laboratory use and patients' blood pressure levels. These findings suggest excess utilization is associated with inefficient use of resources. Saywell et al., using two standardized measures of physician performance, examine the relationship between physicians' performance and utilization and find no relationship, also suggesting that utilization is not analogous with quality.[13]

Oftentimes physicians are directly but unknowingly responsible for excess utilization. Eisenberg has identified five factors that influence the physician in resource allocation: sociologic characteristics of the patients; sociologic characteristics of the physician; the physician's interaction with other professionals and the health care system; and the physician's interpersonal relationship with the patient.[14] Patient age appears to be the most critical factor influencing physicians' resource allocation. Sudnow, in his study on dying, observes that physicians and nurses in emergency rooms work less intensively to save a dying older person than a younger person.[15] Fox and Swazey describe the physician's role as gatekeeper in deciding who should receive a renal transplant with the age of the recipient considered from both a sociological as well as biomedical viewpoint.[16] Similarly, Katz and Proctor identify patient age as an important criterion used by kidney dialysis center directors to select transplant candidates.[17]

A number of theories have been proposed to explain why the elderly are treated differently from other patients. Papper suggests the aged are perceived to be socially undesirable because they are different from medical students.[18] Strain suggests some of the negative views of the aged held by physicians are due to the failure of medical schools to teach about the normal aging process.[19] Medical students' experience with the elderly may lead them to

equate aging with disability, death, and a sense of therapeutic hopelessness, as several studies indicate that physicians experience higher rates of therapeutic failures with the elderly. The mortality rate for emergency surgery is greater for older than younger patients and the rate of mortality for elective surgery is higher. One explanation for the latter is that more surgery is being performed on sicker patients.[20] A reason for higher mortality rates also is the higher rate of complications experienced by the elderly. In a study comparing complication rates of hospitalized persons 70 and over with persons hospitalized under 70, the more senior group had a rate of 60 percent, twice as high as those under 70.[21] Another factor contributing to the frustration of physicians in obtaining a satisfactory outcome for elderly persons involves mental and physical disabilities. Incontinence and dependence in mobility, feeding, and dressing all increase with age of patients.[22]

Prejudice and discrimination against the elderly has been labeled "ageism" which is similar to other belief systems such as racism and sexism which blame victims for their own situations.[23] The phenomenon of ageism is particularly characteristic of Western culture, in which a person's social value is based on ability to produce.[24] The emphasis on ability to produce is consistent with some economic but not humanitarian theories to assist in determining level of public expenditures based on the value of life.[25] Physicians may interpret the medical ethic to do "everything" for a patient according to characteristics of the patient such as age, sex, and functional ability. But whether such interpretations are motivated by prejudice against the elderly, a feeling that the aged have less economic value, or a medical assessment of reduced probability of recovery are open questions.

Previous Research

Many utilization studies compare resource expenditures of persons 65 and over with persons under 65. Few explain how resource expenditures vary within the population 65 and over. Exceptions are two national studies, one from the U.S. and the other from Canada, which examine resource utiiization for persons 65 and over who died. The U.S. study analyzed both utilization and charges, while

the Canadian study looked just at utilization. Both studies found age of the decedent a major influence in the amount of resources used. In the U.S., 58 percent less is spent for persons 85 and over than for persons age 67 to 69.[26] For Medicare patients in 1976, persons 85 and over used 5,484 days of short-stay hospital care per 1,000, compared with 3,684 days for all persons 65 and over.[27] Similar findings are reported in other studies. The finding that patients with highest hospitalization utilization rates do not necessarily have the highest charges, points to the need to examine both the pattern of resource allocation and hospitals' dollar charges as measures of economic resource use if one's goal is to reduce public expenditures.

Sex of the decedent is another variable that in itself and in combination with other factors has been shown to affect resource allocation. For the year 1978, the average length of stay for patients discharged from short-stay hospitals was 10.5 days for males and 11.3 for females over 65. The surgical rates per 1,000 population for persons 65 years and over were 197.1 for males and 154.7 for females.[28] Females have a higher percentage of discharges for persons 65 and over: 55.5% versus 44.5% for males. Some of the difference may be due to the fact that disease rates vary by sex. Males over 65 have higher rates of ischemic heart disease, malignant neoplasm, acute myocardial infarction, and pneumonia; while females have higher rates of fractures, cataracts, diabetes mellitus, arthritis, and rheumatism.[29] More of the female conditions appear to be chronic in nature but of less intensity than the conditions ascribed to males over 65, partly reflecting females' greater longevity.

Marital status and the presence of children are two other characteristics which have direct potential to affect charges for hospital care. Having someone available to assist an elderly person may reduce the frequency and length of hospitalization and thus reduce charges. Conversely, the family may insist on expensive heroic measures. The family's belief system also may influence such decisions as whether to perform cardiopulmonary resuscitation when a person is dying, which can affect both the outcome and cost of care.[30] In a study of persons over and under 65, Lave and Leinhardt found that white married males experienced higher cost per day, males had shorter lengths of stay, and single females had the longest lengths of stay.[31] Single females may have longer lengths of stay because of not having children to care for them if they return home.

Different diagnoses obviously are asociated with different costs. In the National Medicine study, persons with diagnoses of malignant neoplasms had the highest number of discharges (2.2) and cost ($6,621) per person, while persons with diseases of the digestive system and those involved in accidents, poisoning, and violence had the lowest average discharge per patient (1.7).[32] Patients with cerebrovascular disease had the lowest total Medicare reimbursement per patient.[32] Kobrinski and Matteson report from their study on high-cost treatment in acute care facilities, the distribution of cost by diagnostic groups shown in Table 1.[33]

Zook and Moore's study of high-cost users of Medicare report that six diagnoses account for two-thirds of the most costly 20 percent of patients. Those diagnoses are alcoholism and its effects, benign inflammatory bowel disease, cancer, congenital defects, renal failure, and chronic degenerative vascular disease of the heart and peripheral vessels. Like the Lubitz and Prihoda study, patients who died were more likely to be high cost with 20 percent of the high-cost patients as compared to 3-4 percent of the low-cost patients classified as "death in hospital" and "terminal illness." Persons 65 and over accounted for about 40 percent of the high-cost patients and only 15 percent of the low-cost patients. Acuity of the patient's illness also may influence hospital charges. Robertson and Rockwell observed that for elderly (85 and over) hospital admissions, 54.3 percent were classified as urgent (or "emergent")[35] and 22.7 percent were admitted from hospitals outside the city. In a study of emergency admissions that excluded patients who subsequently died, Webb, Thompson, and Whit found that emergency admission patients used more hospital resources and had higher charges per day.[36]

Physicians' perception of the patient's mental and physical status also have been shown to influence hospital treatment patterns and charges. Crane reports that the combination of patient prognosis with physical and mental status influences physician mode of treatment. She found that patients classified as "salvageable with physical damage" were the highest priority, while patients classified as "unsalvageable with mental damage" were the lowest.[37] Lasagna reports that social position in society, ability to pay for care, the patient's physical or social attractiveness, and whether the patient suffers an

Table 1

Diagnosis Groups Most Common to High-cost Patients

Diagnosis Group*	Rank	Total Patients with Charges >$4,000	% of All High-cost Patients	Average Charge	Average Length of Stay
Diseases of circulatory system (H-ICDA 2 codes 390-458)	1	795	30.4%	$7,797	22.3 days
Neoplasms (140-239)	2	409	15.6%	7,640	29.1 days
Injuries and adverse effects (800-999)	3	276	10.5%	8,274	32.0 days
Diseases of digestive system (520-577)	4	224	8.6%	7,649	27.5 days
Mental disorders (290-319)	5	170	6.5%	5,633	34.0 days
Other	-	744	28.4%	7,465	28.0 days
TOTALS	-	2,618	100.0%	$7,575	27.2 days

*Diagnosis groups are based on the chapter headings of the Hospital Adaptation of ICDA (H-ICDA). Second Edition, Commission on Professional and Hospital Activities, Ann Arbor, MI; 1973.

Source: Kobrinski and Matteson.

"appealing" disease such as heart disease or an "unappealing" disease such as cancer, as well as the degree of chronicity of the disease, all influence physician attitudes toward the dying patient.[38] In a study by Brown and Thompson[39], patients with a fever who were confused or comatose were less likely to be treated for the fever in extended care facilities. Other variables associated with non-treatment including being bedridden, in pain, receiving narcotics, being cared for under the direction of the patient's primary physician versus an alternative or consultant, and the point in time when the patient's condition was deteriorating. [39] Lamont, et al. found among patients 75 years old and older, those with abnormal mental status are more likely to have a longer length of stay and be dismissed to a nursing home.[40]

Distance of the patient's home to the hospital also can influence the proportion of procedures performed on an outpatient basis and thus hospital inpatient charges. Eastaugh found for all ages a significant and positive relationship between preoperative length of stay and miles from home for patients with transurethral prostatectomies, unilateral inguinal hernias, and elective surgery. However, the significance did not persist when total length of stay was examined.[41]

The patient's pre- and post-hospital residence is important as a demographic characteristic of the patient, a treatment variable, an approximate measure of health status, and a physician practice style variable. Robertson and Rockwood found a relationship between place of discharge and subsequent death within the year of hospitalization.[42] Forty-one percent of those discharged to an extended care hospital, 40 percent of those transferred to another general hospital, and 16 percent of those discharged home died within one year. In spite of physical limitations, some elderly are able to remain at home due to the assistance of family or friends. The family's ability to care for the disabled elderly was one of the factors Smyer found significantly different between institutionalized elderly and elderly living in the community.[43] According to the 1977 National Nursing Home Survey, of 67 percent of nursing home admissions over 75 years of age, 63 percent were female and 77 percent were unmarried. Medicare or Medicaid was the source of payment for approximately 50 percent. Approximately 40 percent were either bedfast or chairfast, and 16 percent were incontinent of bowels or bladder.[44]

Source of secondary payment for Medicare patients is another variable shown to influence hospital utilization. Link, Long, and Settle report that Medicare patients with no supplemental insurance plan were hospitalized 2.51 days per year, compared with those who had private supplemental insurance (2.79 days) and those with Medicaid supplemental insurance (4.41 days).[45] For patients of all ages, Studnicki[46] found that Medicaid patients, on average, had higher charges than Blue Cross patients. Since the Medicaid patient had longer lengths of stay while the Blue Cross patients had higher intensity of care per day, these findings suggest that money could be saved if Medicaid patients had been treated more like the Blue Cross patients.

Very little research has been conducted on how physician characteristics might affect hospital charges, much less on physician practice variables in relation to hospital charges for persons 65 and over who are in the last year of life. But one potentially important factor is physician age. Freeborn et al. report that younger physicians are higher utilizers of laboratory services, [47] while Hartzema and Christensen find that older physicians prescribe a larger volume of drugs.[48] The patients of the older physicians also tend to be older and this correlation may account for the observed pattern. A similar relationship between patient age and physician age is reported by Sivertson,[49] but Schroeder et al., in a study of annual per patient laboratory and drug costs, found no relationship to physician age.[50]

The socialization of physicians to their profession varies much according to specialty. Physicians who are more specialized seem to be more colleague-dependent. In comparing internists and general practitioners' ordering practices in an ambulatory care setting, Noren et al. found that for nearly all patient problems, internists ordered more laboratory and x-ray tests.[51] In reference to hospital use for patients with coronary heart disease, Goldfarb et al. observed that patients of general practitioners tended to have longer lengths of stay and used more services than specialists.[52] Eisenberg and Nicklin, after controlling for case mix, found for x-rays and laboratory tests that internists ordered approximately the same number as family physicians, while both internists and family physicians ordered more procedures than general practitioners.[53]

A major change recently occurring in the practice of medicine is the growth of physician group practices. Between 1969 and 1980, there was a 70 percent increase in the number of group practices, and by 1980 one out of four physicians was practicing in a group. Single specialty groups represent the largest number of groups, but more physicians practice in multispecialty groups.[54] Some physicians appear to choose solo practice because they value the autonomy it affords while other physicians choose group practice because they feel it allows them to practice better quality medicine, have more professional contact, and be less involved in the business side of medical practice. The frequency of professional contact within groups is greater, as reported by Freidson and Rhea who found that a third of group practice physicians discuss patient problems together at least once a day.[55]

An important public policy question is whether group affiliation affects resource utilization by patients. Dean found that mean hospital charges were higher for orthopedic and general surgery group practices than solo practitioners, while there was no significant difference for medical service patients.[56] Weil found that small hospital-based group practices were associated with lower charges for Medicare patients[57] while Epstein et al., controlling for patient diagnosis, age, sex, physician year of graduation, and the availability of test equipment, found that group size was directly related to test utilization and charges. This study of hypertension patients revealed that in spite of greater resources utilized and higher charges, the group practice patients attained no significant difference in blood pressure readings.[58]

Research Questions

Previously published literature suggests that one method to reduce the escalating cost of health care to the elderly who are in their last year of life is to reduce excess hospital utilization. Higher hospital charges do not appear to be associated with higher quality of care or improved patient outcomes, so may involve potentially inefficient use of resources.

This study asks the questions:

- What patient characteristics affect hospital charges for patients 65 and over during their last year of life?
- Do the hospital charges for patients 65 and over during their last year of life vary significantly according to physician practice arrangement?
- What is the relationship between hospital charges and treatment patterns for patients 65 and over during their last year of life? Does this relationship change when functional status is taken into account? How is it influenced by family characteristics?
- How do hospital charges differ between elderly decedents and non-decedents? How are these two groups otherwise distinguished?

The sensitive nature of these research questions necessitated some compromises in research design to obtain the necessary cooperation with a community hospital. In these highly competitive times, hospitals are reluctant to participate in activities which might reflect negatively on their institution. Thus the principal investigator agreed that every effort possible would be made to assure the cooperating institution's anonymity. A non-experimental exploratory study using a retrospective design was undertaken, in which the dependent variable is observed first and the data are traced back to possible relevant independent variables that are hypothesized to be associated.

The study group includes all patients 65 and over who died at the study hospital during 1981 (n=294) and 1982 (n=304), along with the physicians who treated the decedents. In order to identify how the decedents differed from other patients 65 and over, who did not die but were hospitalized during the study period, an additional group of 118 patients and their physicians was selected. This "survivor" group comprises a quota sample of patients 65 to 74, 75 to 84, and 85 and over, discharged alive from the study hospital during 1981 and 1982, stratified to represent stays in cardiac care, intensive care, and other areas of the hospital. It should be noted, however, that subsequent validation of the sample revealed that 20 percent of the 118 survivors discharged alive, died within the next year or two.

The study physicians were selected by the following manner. The attending physician was designated as the physician to be studied, unless there was a tie in the number of admissions by physicians to patients. In this case, the physician who was responsible for the largest number of hospital days was selected as the study physician. Since the attending physician and admitting physician usually were the same, and since the attending is responsible for hospital care after admission, the attending physician was referenced in all analyses of physician characteristics in relation to charges. Through this process, 142 physicians were identified who had one or more decedents in the study. The number of decedents per physician ranged from one to 39, with one the mode. For the survivors, 78 physicians had one patient in the study with a range of one to ten, and one the mode.

Information concerning each patient was collected from medical records and hospital bills. Some of the data was abstracted from the medical records by specially trained coders using a data collection instrument designed for this study (Appendix A). Supplementary data from medical records previously abstracted, come from the Commission on Professional and Hospital Activities (PAS Complete and Routine Data tapes), specific to the study hospital.

The major source of information on the study physicians was the hospitals' records on its medical staff. For the variable "years since graduated from medical school," the American Medical Association Masterfile of physicians was consulted when necessary. For the item "number of hospitals with privileges," data were obtained from the Metropolitan Health Planning Board (listing of Hospital Staff Overlap, 1981).

Three coders who abstracted data from medical records all were recent graduates of medical records training programs. Two coders who abstracted the data from patients' bills were college students, one of whom had previous experience in abstracting medical records. All of the coders were given an orientation to the purposes of the study, and supervision in defining and locating each of the items they were responsible for retrieving. Inter-coder reliability was established at 90 percent agreement between two coders. A minimum of 10

percent of all finished abstracts were double coded to insure consistency after initial training. During the coding process group discussions and shared decision-making occurred, with consultation from the principal investigator and hospital staff.

Like other forms of data, medical records and abstracts have been shown to have weaknesses, with problems stemming from the fact that medical records basically are communications vehicles between health care professionals. In addition, the abstracting process can introduce unintended errors. However, past studies have established the reliability of data produced by abstracting services which includes one used in this study (Commission on Professional and Hospital Activities).

Bivariate analysis using the Chi-square statistic was performed to test the significance of simple association between independent and dependent variables. The strength of bivariate relationships was measured by Cramer's V with a large value from a possible range of 0-1, indicating a high degree of association. When both the dependent and independent variables are continuous, Pearson's R was used to clarify the degree and direction of association. Step-wise multiple regression was used to determine the extent to which independent variables singularly or in combination explain a change in dependent variables. Discriminant analysis also was used to determine which set of variables, combined as a linear function, best describe the two patient groups known to be clearly different (alive or dead). In all multivariate analyses, the variable with the most explanation power is entered into predictive equations first, followed in descending order by variables that explain the next largest amount. Variables that contributed less than one percent to the total amount of variance explained are considered not to add significantly. For both the bivariate and multivariate analysis, an alpha level of .05 was used to indicate statistical significance.

Characteristics of Decedents and Survivors

The age range for decedents was 65 to 104, and for survivors 65 to 93. Proportions in each age category 65 to 74, 75 to 84, and 85+ are similar as

decedents and controls were matched on this variable. More of the decedents were females; among the survivors, males were more frequent, as indicated in Table 2. Almost half (49%) of the decedents were unmarried at the time of their death. At the time the control group was selected for inclusion in the study, 57 percent were married. The majority of subjects in the control group (52%) named their spouse as next of kin. Decedents named spouses and children with nearly equal frequency (41% each). Both groups had the same modal number of children (2). All the survivor group (N=118) was white; two of the 598 decedents were non-white. Medicare was the primary payor for almost all patients. Secondary coverage involved insurance, Medicaid, and selfpayment. Nearly three-fourths of both groups lived within ten miles of the hospital.

As might be expected, decedents' mental and physical status upon admission to the hospital was poorer than the control group (survivors). Eighteen percent of decedents were confused, compared with 4% of survivors. Twenty-three percent of the survivors could walk when admitted, versus three percent of decedents. Decedents needed more assistance with bathing, toileting, and changing positions than did the controls.

Characteristics of Physicians Treating Decedents and Survivors

The 268 physicians included in this study comprise the admitting and attending physicians who provided care for decedents and survivors. In addition, data were collected on group practices where physicians were affiliated. The characteristics of the 268 study physicians are presented in Table 3.

The study physicians included members of 30 practice groups plus 34 solo practitioners. Just about half (51%) were affiliated with a large multi-specialty group practice. The majority of physicians included in the study and associated with this group were board-certified specialists, unlike the solo practitioners (N=34) more likely to be family physicians. Most of the physicians were males, locally trained, located near the hospital. The majority had been members of the hospital staff seven or more years.

Table 2

Decedent and Survivors' Characteristics

	Decedent		Survivors	
	n	%	n	%
Age				
65 - 74	253	42%	49	42%
75 - 84	238	40%	47	40%
85 and over	107	18%	22	19%
Sex				
Males	278	47%	62	53%
Females	320	53%	56	48%
Marital Status				
Married	293	51%	49	43%
Not married	285	49%	66	57%
Next of Kin				
Spouse	238	41%	59	52%
Child	239	41%	40	35%
Other Relative	83	14%	11	10%
Friends and Other	27	5%	4	4%

NOTE: Some percentages do not total 100 due to rounding.

Table 3

Physician Characteristics

	n	%
Age		
31 - 39	98	37%
40 - 55	125	47%
56 and over	45	16%
Sex		
Male	247	92%
Female	21	8%
Specialty		
Internal Medicine	92	34%
Surgery	80	30%
Family Practice	49	18%
OB/GYN	18	7%
Other	29	11%
Board Certification		
Yes	143	53%
No	125	47%
Miles from Office to Hospital		
0 - 1	151	56%
2 - 10	94	35%
11 - 15	23	9%
Hospital Staff Status		
Active	192	72%
Courtesy or Provisional	76	28%
Years on Staff		
0 - 1	22	8%
2 - 3	45	17%
4 - 6	45	17%
7 or more	156	58%
Years since Graduation		
4 - 9	61	23%
10 - 20	89	33%
21 - 35	88	33%
36 - 54	29	11%
Number of Hospitals with Privileges		
1	54	21%
2	71	27%
3 - 4	90	34%
5 or more	47	18%
Geographic Location of Medical School		
Minnesota	148	55%
North Central	64	24%
Northeast	39	15%
West	6	2%
Other	11	4%

Hospital Charges

The decedents' hospital charges were higher than survivors' by more than $2000 on average per admission. There is considerable variability, however, as shown in Table 4. Intensity of care was calculated as the ratio of total room and board charges to hospital ancillary charges as for drugs, supplies, and tests. As shown, decedents and controls were treated with about the same intensity (see median) but for survivors there was a greater range in treatment approach. Decedents' daily charges were higher than survivors by about $100 on average, with considerable variation within the group.

Patients' Sex -- Sex of the decedent was not significantly associated with total charges, intensity of care, nor average daily charges. For survivors, there was a significant relationship between patients' sex and intensity of care (P=.0097) as well as average daily charges (P=.0417), but not with total charges per admission. Generally, males received more intensive care than females, which is associated with patients' age, diagnosis and other factors. Over the course of a year, sex was non-significantly related to total charges both for survivors and decedents.

Age -- The age of decedents at the time of their terminal admission was significantly related to total charges (P=.0291) but not intensity of care nor average daily charges. Generally, total charges were higher for the younger decedents, in the 65-74 age group, as shown in Table 5. For non-terminal admissions, age was not significantly related to total nor daily charges but was related to intensity of care (P=.0183). Lower intensity of care (higher values) is associated both with decedents and survivors' older age. Among decedents, age was found to be significantly related to total charges during the last year of life. Younger decedents had higher total charges in the last year of life, as indicated by a negative Pearson's R (-.25, P=.0000). These results are illustrated in Table 6.

Marital Status -- There was no significant relationship between decedents' marital status and any measure of hospital resource utilization. For survivors, marital status was not significantly related to total nor daily charges, but was significantly related to intensity of care (P=.0319).

Table 4

Hospital Resource Use

	Decedents' (N = 598)	Survivors (N = 118)
ADMISSION CHARGES		
Mean (Average)	$ 6,118	$ 3,765
Median (50th Percentile)	$ 3,579	$ 2,644
Highest Charge	$23,137	$23,096
Lowest Charge	$ 191	$ 272
Range of Charges	$72,976	$22,824
Standard Deviation	$ 8,249	$ 3,433
INTENSITY OF CARE		
Mean (Average)	.82	.98
Median (50th Percentile)	.62	.67
Highest Score	7.44	9.00
Lowest Score	.20	.00
Range of Scores	7.42	9.00
Standard Deviation	.75	1.06
CHARGES/DAY		
Mean (Average)	$ 510	$ 410
Median (50th Percentile)	$ 359	$ 350
Highest Daily Charge	$ 7,067	$ 2,334
Lowest Daily Charge	$ .51	$ 149
Range of Charges	$ 6,916	$ 2,184
Standard Deviation	$ 518	$ 263
TOTAL YEAR'S CHARGES		
Mean (Average)	$10,184	$ 6,318
Median (50th Percentile)	$ 6,957	$ 4,706
Highest Yearly Charge	$89,865	$23,096
Lowest Yearly Charge	$ 151	$ 418
Range of Charges	$89,714	$22,678
Standard Deviation	$10,563	$ 5,343

NOTE: Lower scores indicate greater intensity.

Table 5

TOTAL CHARGES PER TERMINAL ADMISSION

BY DECEDENT AGE GROUP

Total Charges Per Terminal Admission	DECEDENT AGE					
	65 - 74		75 - 84		85+	
	N	%	N	%	N	%
$0 - 999 (N=79)	30	11.9	27	11.3	22	20.6
$1000 - 1999 (N=101)	35	13.8	42	17.6	24	22.4
$2000 - 3999 (N=154)	59	23.3	70	29.4	25	23.4
$4000 - 5999 (N=84)	36	14.2	33	13.9	15	14.0
$6000 - 9999 (N=80)	38	15.0	31	13.0	11	10.3
$10,000-79,999 (N=100)	55	21.7	35	14.7	10	9.3
TOTAL = 598	253		238		107	

TABLE 6

HOSPITAL CHARGES DURING LAST YEAR OF LIFE

BY DECEDENT AGE GROUP

Total Charges in Last Year of Life	DECEDENT AGE					
	65 - 74		75 - 84		85+	
	N	%	N	%	N	%
$0 - 3136 (N=132)	39	15.4	57	23.7	36	33.6
$3137 - 6754 (N=156)	55	21.7	67	28.2	34	31.8
$6755 - 12,831 (N=156)	62	24.5	59	24.8	25	23.4
$12,832 - 89.865 (N=164)	97	38.3	55	23.1	12	11.2
TOTAL = 598	253		238		107	

Number of Children -- Decedents' number of children was significantly (P=.0114) related to total hospital charges during the last year of life. This was not true for survivors. Table 7 illustrates that childless decedents may have high total charges nonetheless; the trend by no means is uniform. Notably, the majority of decedents (333 of 598) had three or more children. For the survivors, total charges were non-significantly related to next of kin, intensity of care was significantly related to next of kin (P=.0319), and average daily charges were not significantly related.

Secondary Payment Source -- Secondary payment source was significantly associated with charges during decedents' terminal stay (P=.0015) and preceding non-terminal admissions during the study year (P=.0310). Among survivors, secondary payment source was not significantly related to total charges, intensity of care, nor average daily charges. Among decedents, total charges during the entire last year of life also are significantly related (P=.0129) to secondary payment source. Tables 8 and 9 indicate that privately insured and self-paying decedents are allocated considerably more hospital services than Medicaid recipients.

Miles From Home Address to Hospital -- There is no clear linear relationship between hospital charges and distance from decedents' residence. However, survivors' hospital charges and intensity of care are positively associated with distance from home.

Functional Status -- Among survivors, their means of movement was non-significantly related to total charges during the study period. But among decedents, means of movement on their terminal admission was significantly related (P=.0140) to total charges in the last year of life. As illustrated by Table 10, greater proportions of patients able to walk or admitted per wheelchair had high total charges in the last year of life. (The majority were admitted per litter, however.) Similarly, greater proportions of decedents who were independent or walking on admission received highly intensive care and lower average daily charges. As Table 11 illustrates, a

Table 7

HOSPITAL CHARGES DURING THE LAST YEAR OF LIFE
BY DECEDENTS' NUMBER OF CHILDREN

Total Charges in Last Year of Life	Number of Children 0 N	%	1 - 2 N	%	3+ N	%
$ 0 - 3,136 (N=132)	14	19.2	30	15.6	88	26.4
$ 3,137 - 6,754 (N=156)	22	30.1	48	25.0	86	25.8
$ 6,755 - 12,831 (N=146)	11	15.1	60	31.3	75	22.5
$12,832 - 89,865 (N=164)	26	35.6	54	28.1	84	25.2
TOTAL = 598	73		192		333	

Table 8

HOSPITAL CHARGES FOR DECEDENTS' TERMINAL
STAY BY SELECTED SCONDARY SOURCE OF PAYMENT

Total Charges	Medicaid N	Medicaid %	Insurance N	Insurance %	Self Payment N	Self Payment %
$ 0 - 999 (N=79)	11	14.3	39	12.5	26	13.9
$ 1000 - 1999 (N=101)	12	15.6	52	16.7	33	17.6
$ 2000 - 3999 (N=154)	32	41.6	68	21.8	49	26.2
$ 4000 - 5999 (N=84)	8	10.4	45	14.4	31	16.6
$ 6000 - 9999 (N=80)	8	10.4	39	12.5	31	16.6
$10,000 - 79,999 (N=100)	6	7.8	69	21.1	17	17.0
TOTAL = 576	77		312		187	

Table 9

HOSPITAL CHARGES DURING DECEDENTS' LAST YEAR OF LIFE
BY SELECTED SECONDARY SOURCE OF PAYMENT

Total Charges in Last Year of Life	SECONDARY PAYMENT SOURCES					
	Medicaid		Insurance		Self Payment	
	N	%	N	%	N	%
$0 - 3136 (N=132)	21	27.3	62	19.9	45	24.1
$3137 - 6754 (N=156)	26	33.8	77	24.7	51	27.3
$6755 - 12,831 (N=146)	16	20.8	73	23.4	52	27.8
$12,832 - 89,865 (N=164)	14	18.2	100	32.1	39	20.9
TOTAL = 576	77		312		187	

Table 10

HOSPITAL CHARGES DURING THE LAST YEAR OF LIFE BY DECEDENTS' MEANS OF MOVEMENT AT TERMINAL ADMISSION

Total Charges in Last Year of Life	Walk		Wheelchair		Litter	
	N	%	N	%	N	%
$ 0 - 3,136 (N=122)	3	15.0	15	12.4	104	25.5
$ 3,137 6,754 (N=145)	4	20.0	28	23.1	113	27.7
$ 6,755 - 12,831 (N=130)	5	25.0	34	28.1	91	22.3
$12,832 - 89,865 (N=152)	8	40.0	44	36.4	100	24.5
TOTAL = 549	20		121		408	

Table 11

HOSPITAL CHARGES DURING DECEDENTS' LAST YEAR OF LIFE BY TRANSFERRING ABILITY ON TERMINAL ADMISSION

Total Charges in Last Year	Independent		Needs Assistance		Dependent	
	N	%	N	%	N	%
$ 0 - 3,136 (N=74)	6	9.5	21	20.6	47	22.1
$3,137 - 6,754 (N=97)	11	17.5	19	18.6	67	31.5
$6,755 - 12,831 (N=95)	23	36.5	24	23.5	48	22.5
$12,832 - 89,865 (N=112)	23	36.5	38	37.3	51	23.9
TOTAL = 378	63		102		213	

higher proportion of decedents who, on the terminal admission, were more independent experienced higher hospital charges during their last year of life. The relationship between transferring ability and hospital charges likewise was significant (P=.0000). Independence measured by toileting and bathing ability showed the same pattern of results.

Mental Status -- Decedents' mental status at the time of their terminal admission was significantly associated with hospital charges (P=.0225) and average daily charges (P=.0100). Table 12 indicates that larger proportions of high-charge patients were mentally alert. Patients who were more alert received care of higher intensity and experienced higher average charges. Mental status of survivors was not significantly related to intensity of care and average daily charges but was positively associated with total charges during the study year (P=.0385). As shown by Table 13, decedents' alert mental status was further associated with higher hospital charges in the entire last year of life.

Secondary Diagnosess -- Since it is common for decedents to have multiple diagnoses, the relationship between hospital charges and number of diagnoses beyond the primary one was examined. The relationship between the hospital charges and decedents' number of secondary diagnoses was significant (P=.000) as shown in Table 14. Among survivors, total charges per admission were not significantly related to the number of secondary diagnoses; however, intensity of care (P=.0010) and average daily charges (P=.0072) were related to additional diagnoses.

Pre-Hospitalization Health Resource Use

Decedents who received care from other acute facilities and nursing homes before their terminal admission, had significantly higher total hospital charges, as shown by Table 15. Conversely, those decedents admitted after receiving home health care or nursing home care received less intensive hospital care (see Table 16). Among the survivor-control group, admission from nursing homes and home health care status was not significantly related to charges, intensity of care, nor average daily charges.

Table 12

HOSPITAL CHARGES BY DECEDENTS' MENTAL STATUS
ON TERMINAL ADMISSION

Total Charges for Terminal Admission	Alert		Alert Most of the Time		Confused Most of the Time	
	N	%	N	%	N	%
$0 - 999 (N=50)	23	7.9	13	15.7	14	17.5
$1,000 - 1,999 (N=69)	45	15.4	10	12.0	14	17.5
$2,000 - 3,999 (N=116)	73	25.0	23	27.7	20	20.0
$4,000 - 5,999 (N=70)	43	14.7	19	22.9	8	10.0
$6,000 - 9,999 (N=63)	43	14.7	6	7.2	14	17.5
$10,000 - 79,999 (N=87)	65	22.3	12	14.5	10	12.5
TOTAL = 455	292		83		80	

Table 13

HOSPITAL CHARGES DURING LAST YEAR OF LIFE
BY DECEDENTS' MENTAL STATUS

Total Charges in Last Year of Life	Alert		Alert Most of Time		Confused Most of Time	
	N	%	N	%	N	%
$0 - 3,136 (N=96)	64	17.2	13	12.9	19	35.2
$3,137 - 6,754 (N=134)	84	22.5	35	34.7	15	27.8
$6,755 - 12,831 (N=135)	95	25.5	29	28.7	11	20.4
$12,832 - 89,865 (N=163)	130	34.9	24	23.8	9	16.7
TOTAL = 528	373		101		54	

Table 14

NUMBER OF SECONDARY DIAGNOSES AND TOTAL CHARGES
FOR DECEDENTS' TERMINAL ADMISSION

Total Charges	Number of Secondary Diagnoses							
	0 - 1		2 - 4		5 - 9		10 - 19	
	N	%	N	%	N	%	N	%
$0 - 999 (N=79)	15	21.7	39	17.6	23	9.2	2	3.4
$1,000 - 1,999 (N=101)	21	30.4	45	20.4	31	12.4	4	6.9
$2,000 - 3,999 (N=154)	17	24.6	61	27.6	68	27.2	8	13.8
$4,000 - 5,999 (N=84)	8	11.6	28	12.7	42	16.8	6	10.3
$6,000 - 9,999 (N=80)	6	7.5	26	11.8	36	14.4	12	20.7
$10,000 - 79,999 (N=100)	2	2.9	22	10.0	50	20.0	26	44.8
TOTAL = 598	69		221		250		58	

Table 15

HOSPITAL CHARGES FOR TERMINAL ADMISSIONS FOLLOWING OTHER INSTITUTIONAL STAYS

Total Charges	Acute Care Admits			
	No		Yes	
	N	%	N	%
$0 - 999 (N=79)	79	14.0	0	0
$1,00 - 1,999 (N=101)	94	16.7	7	20.6
$2,000 - 3,999 (N=154)	149	26.4	5	14.7
$4,000 - 5,999 (N=84)	79	14.0	5	14.7
$6,000 - 9,999 (N=80)	74	13.1	6	17.6
$10,000 - 79,999 (N=100)	89	15.8	11	32.4
Total = 598	564		34	

Total Charges	Nursing Home Admits			
	No		Yes	
	N	%	N	%
$0 - 999 (N=79)	56	12.0	23	17.3
$1,000 - 1,999 (N=101)	78	16.8	23	17.3
$2,000 - 3,999 (N=154)	111	23.9	43	32.3
$4,000 - 5,999 (N=84)	67	14.4	17	12.8
$6,000 - 9,999 (N-80)	68	14.6	12	9.0
$10,000 - 79,000	85	18.3	15	11.3
Total = 598	465		133	

Table 16

INTENSITY OF CARE DURING DECENDENTS'
TERMINAL ADMISSION AFTER ADMITTION FROM NURSING HOMES

Intensity of Care	Nursing Home Admit				Home Health Care Status			
	Yes		No		Yes		No	
	N	%	N	%	N	%	N	%
0 - 0.325 (N=265)	54	40.6	211	45.4	8	25.0	106	44.7
0.326 - 0.655 (N=143)	33	24.8	110	23.7	6	18.8	61	25.7
0.616 - 1.055 (N=108)	36	27.1	72	15.5	7	21.9	45	19.0
1.056 - 7.440 (N=82)	10	7.5	72	15.5	11	34.4	25	10.5
Total = (598)(269)	133		465		32		237	

Place of Discharge -- Discharge destination was analyzed for decedents' non-terminal discharges and for all survivors' stays. Table 17 illustrates a significant relationship between hospital charges and patients' discharge home. When patients returned home, hospital care was more intense, and average charges per day were lower.

Emergency Room Admissions -- As might be expected, admission through the emergency room is significantly associated with hospital inpatient charges both for terminal and non-terminal admissions. Table 18 indicates that decedents during terminal and non-terminal admissions, admitted through the hospital's emergency room, were less likely to have total charges at the high and low ends of the continuum. High intensity of care, reflected by a lower score, is associated with emergency room admission for terminal admissions (P=.0000), but for non-terminal admissions the converse is true. Admission through the emergency room was significantly (P=.0138) related to total charges during the study year for survivors, but this was not the case for decedents. Those whose final admission was through the emergency room experienced lower total charges during the last year of life (P=.0023), as shown by Table 19.

Early Surgery -- Having surgery early during terminal and non-terminal hospital stays was significantly associated with total charges (P .05) as illustrated by the following table (20), and also with intensity of care. For decedents' terminal admissions, a higher proportion with surgery early in the admission experienced higher total charges in the entire last year of life (P=.0000) with results similar to Table 20.

Consultations -- The use of consultations by other physicians was significantly related to all hospital charge variables except average daily charge for non-terminal admissions. Larger proportions of patients who had highly intensive hospital care and high average daily charges for terminal admissions also received consultations. Similarly, the number of physicians writing orders in the patient's record was found strongly, significantly related to all hospital charge and intensity variables for survivors and decedents. The strength of relationship between total number of physicians writing orders and

Table 17

HOSPITAL CHARGES AMONG PATIENTS DISCHARGED HOME

Total Charges	Discharge Home			
	Yes		No	
	N	%	N	%
$0 - 999 (N=120)	107	21.3	13	7.0
$1,000 - 1,999 (N=193)	152	30.2	41	22.2
$2,000 - 3,999 (N=199)	140	27.8	59	31.9
$4,000 - 5,999 (N=75)	49	9.7	26	14.1
$6,000 - 9,999 (N=64)	38	7.6	26	14.1
$10,000 - 79,999 (N=37)	17	3.4	20	10.8
TOTAL = 688	503		185	

Table 18

HOSPITAL CHARGES FOR DECENDENTS' TERMINAL AND NON-TERMINAL ADMISSIONS AFTER ADMISSION THROUGH THE EMERGENCY ROOM

Total Charges	Terminal Admission ER Admission Yes N	%	No N	%	Non-terminal Admission ER Admission Yes N	%	No N	%
$0 - 999 (N=79) (N=119)	26	9.0	53	17.1	17	7.9	102	21.8
$1,000 - 1,999 (N=102) (N=192)	51	17.7	50	16.1	60	27.8	132	28.2
$2,000 - 3,999 (N=154) (N=198)	89	30.9	65	21.0	78	36.1	120	25.6
$4,000 - 5,999 (N=84) (N=75)	45	15.6	39	12.6	33	15.3	42	9.0
$6,000 - 9,999 (N=80) (N=64)	36	12.5	44	14.2	18	8.3	46	9.8
$10,000 - 79,999 (N=100) (N=36)	41	14.2	59	19.0	10	4.6	26	5.6
Total = (598) (684)	288		310		216		468	

Table 19

HOSPITAL CHARGES DURING THE LAST YEAR OF LIFE AFTER TERMINAL ADMISSION THROUGH EMERGENCY ROOM

Total Charges in the Last Year of Life	Admission Through Emergency Room			
	Yes		No	
	N	%	N	%
$ 0 - 3,136 (N=132)	73	25.3	59	19.0
$ 3,137 - 6,754 (N=146)	87	30.2	69	22.3
$ 6,755 - 12,831 (N=136)	67	23.3	79	25.5
$12,832 - 89,865 (N=164)	61	21.2	103	33.2
TOTAL = 598	288		310	

Table 20

HOSPITAL CHARGES FOR TERMINAL ADMISSION
BY DAYS PRECEDING SURGERY

Total Charges	DAYS PRECEDING SURGERY							
	Less Than One		One		Two		More Than Two	
	N	%	N	5	N	%	N	%
$0 - 999 (N=5)	2	3.6	2	2.6	1	2.0	0	0
$1000 - 1999 (N=17)	8	14.5	7	9.0	1	2.0	0	0
$2000 - 3999 (N=45)	15	27.3	22	28.2	8	15.7	0	0
$4000 - 5999 (N=43)	8	14.5	19	24.4	4	7.8	13	19.7
$6000 - 9999 (N=52)	10	18.2	8	10.3	13	25.5	21	31.8
$10,000 - 79,000 (N=88)	12	21.8	20	25.6	24	47.1	32	48.5
TOTAL = 250	55		78		51		66	

total charges is revealed by a high Pearson's R of .68427 with P=.0000. The number of physicians writing orders ranged from 1 to 35 with a mode of 2 and mean of 5. It is not surprising that the number of physicians writing orders on the patient's terminal admission also was related to total charges in the entire last year of life (P=.0000).

Medical complications -- When medical complications occurred, total charges both for terminal and non-terminal admissions, intensity of care, and average daily charges, all were increased. Table 21 illustrates that a higher proportion of decedents with complications had high charges. Medical complications also were associated with significantly high total charges during the entire last year of life.

Number of Days in Special Care -- The number of days decedents spent in intensive care was significantly related to total charges per admission both for terminal and non-terminal admissions as well as to intensity of care and average daily charges. Number of intensive care days was not significantly related to survivors' charges per admission, intensity of care, and average daily charges, however.

Length of Hospital Stay -- As one would expect, the length of patients' terminal and non-terminal hospital stays was significantly related to total charges per admission, intensity of care, and average daily charges. For total charges during the study year, length of stay also was significantly related. Likewise, the greater the number of admissions during the last year of life, the higher decedents' total charges, intensity of care, and average charges per day.

Death Experience -- Receiving cardiopulmonary resuscitation was significantly associated with lower total charges during the last year of life, as shown in Table 22, and also with shorter length of stay. Patient age did not seem to affect whether a decedent was given cardiopulmonary resuscitation, nor did physician age.

Table 21

TOTAL CHARGES FOR TERMINAL ADMISSIONS WITH MEDICAL COMPLICATIONS

Total Charges	Medical Complications: Yes		No	
	N	%	N	%
$ 0 - 999 (N=79)	5	4.3	74	15.4
$ 1,000 - 1,999 (N=101)	11	9.5	90	18.7
$ 2,000 - 3,999 (N=154)	18	15.5	136	28.2
$ 4,000 - 5,999 (N=84)	18	15.5	66	13.7
$ 6,000 - 9,999 (N=80)	16	13.8	64	13.3
$ 10,000 - 79,999 (N=100)	48	41.4	52	10.8
TOTAL = 598	116		482	

Table 22

TOTAL CHARGES DURING THE LAST YEAR OF LIFE
FOR DECEDENTS WHO HAD CARDIOPULMONARY RESUSCITATION

Total Charges in Last Year of Life	Cardiopulmonary Resuscitation			
	Yes		No	
	N	%	N	%
$0 - 3,136 (N=132)	44	39.6	88	18.1
$3,137 - 6,754 (N=156)	23	20.7	133	27.3
$6,755 - 12,831 (N=146)	24	21.6	122	25.1
$12,832 - 89,865 (N=164)	20	18.0	144	29.6
TOTAL = 598	111		487	

Comparison of Decedents and Controls

For selected variables, the decedents on their terminal admission and survivors were compared. As illustrated in Table 23, total charges for the two groups were significantly different, with decedents experiencing higher total charges. There was a significant difference also in the intensity of care given to decedents and controls. As illustrated, a higher proportion of decedents received intensive care (reflected by a lower score).

Total charges for all admissions during the study year were significantly different for decedents and survivors (Chi Square P=.0000, Cramer's V = .17991). As Table 23 illustrates, a higher proportion of decedents experienced high total charges for the year. Other differences between decedents and survivors include these findings:

- A higher proportion of persons admitted from nursing homes were decedents.
- A higher percentage of decedents were admitted through the emergency room.
- A higher proportion of decedents' care included consultation than did survivors.
- A higher proportion of decedents spent time in intensive and cardiac care.
- The most frequent diagnostic category for the decedents was diseases and disorders of the circulatory system (N=151 or 25.3%), followed by diseases and disorders of the respiratory system (N=103 or 17.2%) and diseases and disorders of the nervous system (N=91 or 15.2%). For survivors, the most frequent diagnostic category also was diseases and disorders of the circulatory system (N=30 or 26.8%), followed by diseases and disorders of the digestive system (N=17 or 15.2%), and then by diseases and disorders of the nervous system (n=14 or 12.5%).

Physician Characteristics

Non-significant relationships were found between physicians' age and total charges per admission as well as total charges for the study year both for decedents and survivors. Many of the physicians had staff privileges at hospitals in addition to the study hospital, and this was significantly related to patients' hospital charges during the study year.

The number of years a physician was on the hospital staff showed a significant relationship with total charges per admission but not with patients' total charges during the study year. The number of years since the physician

Table 23

HOSPITAL CARE FOR DECEDENTS AND SURVIVORS

Total Charges for Admission	Decedents N	Decedents %	Survivors N	Survivors %
$0 - 999 (N=98)	79	13.2	19	16.1
$1,000 - 1,999 (N=128)	101	16.9	27	22.9
$2,000 - 3,999 (N=189)	154	25.8	35	29.7
$4,000 - 5,999 (N=98)	84	14.0	14	11.9
$6,000 - 9,999 (N=96)	80	13.4	16	13.6
$10,000 - 79,999	100	16.7	7	5.9
Total = 716	598		118	
Intensity of Care				
0 - 0.325 (N=281)	265	44.3	16	13.6
0.326 - 0.615 (N=182)	143	23.9	39	33.1
0.616 - 1.055 (N=143)	108	18.1	35	29.7
1.056 - 7.440 (N=110)	82	13.7	28	23.7
Total = 716	598		118	
Average Daily Charges				
$0.00 - 259.20 (N=107)	82	13.7	25	21.2
$259.21 - 359.05 (N=138)	106	17.7	32	27.1
$359.06 - 560.00 (N=181)	139	23.2	42	35.6
$560.01 - 7067.00	271	45.3	19	16.1
Total = 716	598		118	
Total Charges during Study Year				
0 - 3,136 (N=179)	132	22.1	47	39.8
$3,137 - 6,754 (N=179)	156	26.1	23	19.5
$6,755 - 12,831 (N=179)	146	24.4	33	28.0
$12,832 - 89,865 (N=179)	164	27.4	15	12.7
Total = 716	598		118	

graduated from medical school was not significantly related to charges of either type. Charges per admission were not significantly related to the attending physician's number of colleagues in joint practice but was related to total charges during the study year.

Concerning physician specialty, a significant relationship was observed with total charges per admission. As indicated by Table 24, larger proportions of high charges were associated with surgeons. However, no significant relationship was found between total charges in the study year and physician specialty.

Multivariate Analysis

Multiple regression of total charges in the last year of life was conducted using physician variables and patient variables for all diagnoses. In addition, regression was repeated per diagnostic group where there were sufficiently large numbers of cases. A final multiple regression on total charges in the last year of life was performed using physician, patient, non-hospital health resource, and hospital resource variables. Two discriminant analyses also were performed: one comparing decedents with survivors and one comparing decedents with highest charges against decedents with lowest charges. In the presentation below, only variables explaining 1% or more of the variance are discussed. Results for other variables are shown in Table 24.

As indicated by Table 25, it took 18 physician variables to explain 6.7% of the variation in total charges during the study year. Examination of the table shows that physician specialty accounts for more than 50% of the variance explained. In order to set aside the variations introduced by patients' diagnosis in relation to physician variables, regression of total charges during the study year was performed for each of four most frequent major diagnostic categories (MDCs) and three most frequent diagnostic-related groups (DRGs). Within major diagnostic category 1, "diseases and disorders of the

TABLE 24

HOSPITAL CHARGES FOR DECEDENTS AND SURVIVORS BY ATTENDING PHYSICIAN SPECIALTY

Total Charges Per Admission	Specialty Type									
	Family Practice		Internist		Surgeon		OB-GYN		Other	
	N	%	N	%	N	%	N	%	N	%
$0 - 999 (N=98)	21	15.4	65	13.9	12	12.0	0	0	0	0
$1,000 - 1,999 (N=128)	29	21.3	82	17.6	10	10.0	2	66.7	5	45.5
$2,000 - 3,999 (N=189)	40	29.4	125	26.8	22	22.0	0	0	2	18.2
$4,000 - 5,999 (N=98)	18	13.2	65	13.9	12	12.0	1	33.3	2	18.2
$6,000 - 9,999 (N=96)	16	11.8	59	12.7	20	20.0	0	0	1	9.1
$10,000 - 79,999 (N=107)	12	8.8	70	15.0	24	24.0	0	0	1	9.1
TOTAL = 716	136		166		100		3		11	

Table 25

REGRESSION OF PHYSICIAN VARIABLES ON TOTAL CHARGES
IN THE LAST YEAR OF LIFE FOR THE DECEDENTS

	F TO ENTER OR REMOVE	SIGNIF.	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVERALL F	SIGNIF.
Surgeon	15.18054	.000	.15760	.02484	.02484	.15760	15.18054	.000
Family Practice	8.14351	.004	.19495	.03800	.01317	-.14007	11.75300	.000
# Hospitals w/Privileges	3.82644	.051	.21015	.04416	.00616	.08522	9.14803	.000
Single Specialty Group	2.96410	.086	.22117	.04892	.00475	.09895	7.62474	.000
Medical School, Minnesota	1.96982	.161	.22819	.05207	.00315	.07029	6.50373	.000
Board Certified	1.14871	.284	.23218	.05391	.00184	-.03951	5.61259	.000
Years on Hospital Staff	2.74489	.098	.24143	.09829	.00438	.03342	5.21712	.000
# of Office Locations	.91828	.338	.24445	.05976	.00147	.03742	4.67913	.000
Medical School, Central	.81026	.368	.24708	.06105	.00129	-.01184	4.24792	.000
Total # in MD Specialty	.95935	.328	.25015	.06258	.00153	-.01403	3.91889	.000
Medical School, East	.63096	.427	.25217	.06359	.00101	-.04177	3.61766	.000
Hospital Staff Status	.72382	.395	.25445	.06475	.00116	-.02509	3.37495	.000
Total # in Group	.59240	.442	.25631	.06569	.00095	.00061	3.15873	.000
Specialty OB/GYN	.31986	.572	.25731	.06621	.00051	.01527	2.95254	.000
Distance of Primary Office	.22524	.635	.25881	.06657	.00036	-.02221	2.78706	.000
Multispecialty Group	.09170	.762	.25829	.06672	.00015	-.01183	2.59580	.001
MD Age in Years	.04339	.835	.25843	.06679	.00007	.02986	2.44164	.001
Sex	.04481	.832	.25857	.06686	.00007	-.00945	2.30468	.002

nervous system," the same list of physician variables as shown in Table 25, was entered into regression equations. These variables explained 13.6% of the variance in total charges compared with 20% of the variance in charges associated with the diagnostic category "diseases and disorders of the respiratory system." For "specific cerebrovascular disorders and diseases and disorders of the circulatory system," the regression equation was non-significant. However, within major diagnostic group 6, "diseases and disorders of the digestive system," the entire equation was significant with 11 variables entered, these explaining 33.5% of the variance. Variables explaining at least 1% of the variance and associated with higher charges for this MDC include: medical school location (11%), surgical specialty (10.7%), single specialty practice association (4%), greater distance of primary office from study hospital (2.5%), younger physician age (2.2%), and fewer total number of physicians per practice affiliation.

For diagnostic-related group #82, "respiratory neoplasms," the regression equation was significant with three physician variables explaining 22.7% of the variance. Distance from physicians' primary office to hospital indicates that physicians who are located closer to the hospital have patients with higher charges. For the regression analysis within DRG #123, "circulatory disorders with acute myocardial infarction," physician variables explained 33.2% of the variance in total charges. As years on hospital staff increased and number in physician specialty per practice affiliation increased, patients' charges also increased. As number of hospitals with which physicians had staff privileges increased, total charges decreased.

Regression Analysis with Patient Variables

Regression of patient variables on total charges in the last year of life explained 27.2% of the variance. Four variables, when entered into the equation (see Table 26), added 1% or more to the variance explained. Number of secondary diagnoses explained 14.4% of the variance with persons having more diagnoses, also having higher charges in the last year of life. The variable DRG explained 5%, while age explained 4%. As the decedents' age increased,

Table 26

REGRESSION OF PATIENT VARIABLES ON
TOTAL CHARGES IN THE LAST YEAR OF LIFE FOR DECENDENTS

	F TO ENTER OR REMOVE	SIGNIF.	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVERALL F	SIGNIF.
# of Additional Diagnoses	98.65922	0	.37960	.14410	.14410	.37960	98.65922	.000
Diagnostic-Related Groups	36.52062	0	.44090	.19439	.05029	.29653	70.58005	.000
Age	30.59084	.000	.43424	.23449	.04010	-.23974	59.63040	.000
Secondary Payment Source, Other	7.76374	.006	.49452	.24455	.01006	.15938	47.18170	.000
Proportion of Admission from Home Care	4.48608	.035	.50033	.25033	.00578	.05802	38.86828	.000
Next of Kin, Other	2.55713	.110	.50360	.25361	.00329	.02267	32.90308	.000
Proportion of Admission, Walk	1.65921	.198	.50571	.25574	.00213	-.14427	28.47167	0
Next of Kin, Spouse	1.83216	.176	.50803	.25809	.00235	.06300	25.17747	.000
Proportion of Nonterminal Discharges Home	1.67966	.195	.51014	.26024	.00215	.02533	22.59288	.000
Secondary Payment Source, Insurance	1.39111	.239	.51188	.26202	.00178	.08410	20.48646	.000
# of Possible Diagnoses	1.32470	.250	.51353	.26371	.00169	.05671	18.75496	.000
# of Children	.67331	.412	.51437	.26458	.00086	.03318	17.23841	.000
Proportion of Admission, Independent on Toileting	.59901	.439	.51511	.26534	.00077	.00710	15.94735	.000
Proportion of Admission, Independent on Transfering	2.36816	.124	.51804	.26837	.00302	-.03464	15.01271	.000
Proportion of Admission from Nursing Home	.47225	.492	.51862	.26897	.00060	-.05775	14.03044	.000
Secondary Payment Source, Medicaid	.59721	.440	.51936	.26973	.00076	-.06070	13.18160	.000

Continued...

Table 26 (continued)

	F TO ENTER OR REMOVE	SIGNIF.	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVERALL F	SIGNIF.
Marital Status	.45681	.499	.51992	.27032	.00058	.07723	12.42128	.000
Proportion of Admission Alert	.29812	.585	.52029	.27070	.00038	-.00890	11.73333	.000
Proportion of Admission, Independent on Bathing	.27288	.602	.52062	.27105	.00035	.00582	11.11594	.000
Sex	.15836	.691	.52082	.27125	.00020	.05706	10.55241	.000
Next of Kin, Unknown	.13657	.712	.52099	.27143	.00018	-.04144	10.04112	.000
Next of Kin, Friend	.13488	.714	.52116	.27160	.00017	.00592	9.57618	.000

total charges decreased. Secondary payment source "other" explained 1% of the variance and was associated with higher total charges in the last year of life. Patients in this category had income too high for Medicaid; and their care was covered by a special hospital fund.

For survivors, using the same list of variables as in Table 26, patient variables explained 42.8% of the variance in total charges. Ten of those variables added at least 1% to the variance explained when they entered the equation. Diagnostic-related group accounted for 18.1% of the variance; increasing numbers of additional diagnoses (5.7%), a higher proportion of admissions from home care (3.1%), patients' home residence closer to the study hospital (2.4%), and younger age (1.2%). Next of kin "spouse" explained 2.8% of the variance in total charges, secondary payment source "self," 1.9%, sex "male," 1.1%, and next of kin "unknown," 1.1%, as shown in Table 27.

In order to further explicate the relationship between total charges in the last year of life and patient variables, regression analysis was performed specifically on the decedents' four most frequent major diagnostic categories and the three most frequent diagnostic groups. Using the same list of regressors as in the previous tables, for the major diagnostic category "diseases and disorders of the nervous system," 46.9% of the variance was explained by patient variables. Four variables each explained more than 1% of the variance: secondary payment source "other" (28.8%), secondary diagnoses (7.6%), secondary payment source "insurance" (2.6%), and proportion of admission by type of movement (2.6%). The results confirm that persons with secondary payment source "other" and "insurance" have higher total charges as do persons with additional diagnoses. Persons able to walk upon admission also have higher total charges, holding other factors constant.

For major diagnostic category 4, "diseases and disorders of the respiratory system," 32% of the variance was explained by just six variables. The patients' DRG classificiation explained 18.3% of the variance. Younger decedents had lower total charges, with age explaining 6.1% of the variance. Persons with more diagnoses experienced higher total charges. Decedents with a

Table 27 (continued)

	F TO ENTER OR REMOVE	SIGNIF.	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVERALL F	SIGNIF.
Proportion of Admission Independent on Transfering	.14136	.708	.65295	.42635	.00084	-.02269	4.00507	.000
Secondary Payment Source, Other	.12751	.722	.65353	.42711	.00076	.07298	3.76686	.000
Proportion of Nonstudy Selection Admission Home	.11536	.735	.65406	.42780	.00069	.02819	3.55131	.000
Next of Kin, Friend	.08441	.772	.65446	.42831	.00051	-.03503	3.35362	.000

Table 27

REGRESSION OF PATIENT VARIABLES
ON TOTAL CHARGES DURING STUDY YEAR FOR SURVIVORS

	F TO ENTER OR REMOVE	SIGNIF.	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVERALL F	SIGNIF.
Diagnostic-Related Group	25.11873	.000	.42492	.18056	.18056	.42492	25.11873	.000
# of Additional Diagnoses	6.48818	.004	.48766	.23781	.05725	.25877	17.62843	.000
Next of Kin, Self	4.20701	.043	.51517	.26540	.02759	.13805	13.48816	.000
Proportion of Admission from Home Health Care	4.93148	.028	.54466	.29665	.03125	.16937	11.70409	.000
Secondary Payment Source, Self	3.12472	.080	.56221	.31608	.01943	.08856	10.16745	.000
Miles from Residence to Hospital	3.90495	.051	.58287	.33973	.02365	-.07647	9.34745	.000
Age	2.07070	.153	.59343	.35215	.01242	-.14811	8.38662	.000
Sex	1.92006	.169	.60297	.36357	.01142	.01429	7.64082	.000
Next of Kin, Unknown	1.73814	.190	.61143	.37384	.01027	.08263	7.03182	.000
# of Possible Diagnoses	2.07037	.153	.62125	.38595	.01211	.12315	6.59958	.000
Marital Status	1.34134	.249	.62751	.39377	.00782	.07490	6.14106	.000
Next of Kin, Other Relative	1.33951	.250	.63368	.40155	.00778	-.11063	5.75931	.000
# of Children	.99021	.322	.63820	.40731	.00575	-.06991	5.39195	.000
Proportion of Admission Alert	1.09569	.298	.64317	.41367	.00636	.04839	5.08977	.000
Proportion of Admission from Nursing Home	.33549	.564	.64469	.41563	.00196	.07623	4.74156	.000
Proportion of Admission Independent on Toileting	.24636	.621	.64582	.41708	.00145	-.04267	4.42711	.000
Proportion of Admission Independent on Bathing	1.43838	.233	.65231	.42551	.00843	.09123	4.26975	.000

Continued...

higher proportion of previous discharges home had higher total charges explaining 1.1% of the variance. Decedents with secondary payment source "Medicaid" had lower total charges (1.2%).

Charges for diseases and disorders of the circulatory system (major diagnostic category 5) were explained largely by patient characteristics. Five variables accounted for 46.1% of the variance. Decedents with secondary diagnoses accounted for 35.1% of the variance experiencing higher charges as the number of diagnoses increased. The total number of possible diagnoses during the study year added 4.3% to the variance explained, with persons who had more possible diagnoses experiencing higher total charges. The DRG classification itself accounted for 3.4% of the variance. Persons whose next of kin was "friend" experienced higher total charges as did the person whose secondary payment source was insurance.

The regression of patient variables on total charges for major diagnostic category 6, "diseases and disorders of the digestive system," explained more than 50% of the variance. Eleven variables explained at least 1% to the variance when they entered the equation. The relationship and percentage explained are as follows: The younger the decedent the higher the total charges (10.2%). As the number of diagnoses increases, so does total charges (7.0%). DRG patient classificiation explains 3.6% of the variance. Other predictors are number of children (3.3%), admissions from nursing homes (2.9%), secondary payment source "other" (2.7%), and mental confusion (2.5%).

For diagnostic-related group 14, "cardiovascular diseases except TIA," 21 variables entered the equation and ten of them jointly accounted for 55.3% of the variance. As with the other regression equations within diagnostic categories, having an increasing number of additonal diagnoses is shown to be associated with increasing total charges (27.8%). Younger decedents experienced higher total charges (7.0%). Persons who were able to walk into the hospital on a higher proportion of admissions had higher charges (3.2%) as did the decedents with more possible diagnoses (2.0%). Persons who were more dependent in bathing (2.1%), transferring (1.8%), toileting (3.9%), and were

Table 28

REGRESSION OF PATIENT AND PHYSICIAN
VARIABLES ON TOTAL CHARGES IN THE LAST YEAR OF LIFE

	F TO ENTER OR REMOVE	SIGNIF.	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVERALL F	SIGNIF.
# of Additional Diagnoses	89.06267	0	.37960	.14410	.14410	.37960	89.06267	0
Diagnostic-related Group	32.96220	.000	.44090	.19439	.05029	.29653	63.70302	.000
Age	27.60509	0	.48424	.23449	.04010	-.23974	53.81031	0
Secondary Payment Source, Other	7.00467	.008	.49452	.24455	.01006	.15938	42.56874	.000
Family Practitioner	6.99420	.008	.50446	.25448	.00993	-.14007	35.84192	0
# in MD Specialty	5.47140	.020	.51204	.26219	.00770	-.01403	31.03455	.000
Proportion of Admission from Home Care	4.25515	.040	.51782	.26814	.00595	.05802	27.37417	0
Next of Kin, Other	3.13451	.077	.52203	.27251	.00437	.02267	24.44197	.000
Proportion of Admission, Walked	2.13299	.145	.52486	.27548	.00297	-.14427	22.01035	0
Next of Kin, Spouse	2.37719	.124	.52799	.27877	.00330	.06300	20.09940	.000
# of Office Locations	2.46298	.117	.53121	.28218	.00341	.03742	18.54749	0
Board Certified	2.80822	.094	.53484	.28605	.00387	-.03951	17.29512	.000
Proportion of Discharges Home	2.03652	.154	.53745	.28885	.00280	.02533	16.15333	0
Medical School, Minnesota	1.97983	.160	.53997	.29157	.00272	.07029	15.16936	.000
Medical School, Central	1.57304	.210	.54197	.29373	.00216	-.01184	14.27867	0
Years on Hospital Staff	1.35507	.245	.54368	.29558	.00186	.03279	13.48017	.000
Secondary Payment Source, Insurance	1.36989	.242	.54540	.29746	.00188	.08410	12.77693	0
Proportion of Admission, Independent Toileting	1.38485	.240	.54713	.29936	.00190	.00710	12.15309	.000

Continued...

Table 28 (continued)

	F TO ENTER OR REMOVE	SIGNIF.	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVERALL F	SIGNIF.
# of Possible Diagnoses	1.31863	.251	.54878	.30116	.00180	.05671	11.59002	0
Medical School, East	1.37902	.241	.55049	.30304	.00188	-.04177	11.08764	.000
Proportion of Admission, Independent in Transferring	1.06727	.302	.55182	.30450	.00146	-.03464	10.61187	0
Multispecialty Practice Affiliation	.94757	.331	.55299	.30580	.00129	-.01183	10.17154	.000
Single Specialty Practice Affiliation	1.02592	.309	.55427	.30721	.00142	.09895	9.77503	0
Proportion of Admission from Nursing Home	.51805	.472	.55491	.30792	.00071	-.05775	9.38041	.000
Internist	.43240	.511	.55544	.30851	.00059	.00605	9.01239	0
Physician Age	.37037	.543	.55590	.30902	.00051	.02986	8.66920	.000
Secondary Payment Source, Medicaid	.30406	.582	.55627	.30944	.00042	-.06070	8.34785	0
Sex	.25634	.613	.55659	.30979	.00035	.05706	8.04697	.000
Proportion of Admission, Alert	.26335	.608	.55691	.31015	.00036	-.00890	7.76717	0
Surgeon	.16182	.688	.55711	.31038	.00022	.15760	7.50110	.000
OB-GYN	.26468	.607	.55744	.31074	.00037	.01527	7.25699	0
# of Children	.12448	.724	.55760	.31091	.00017	.03318	7.02176	.000
Marital Status	.10045	.751	.55772	.31105	.00014	.07723	6.79973	0
Family Practice Arrangement	.06347	.801	.55780	.31114	.00009	-.05077	6.58916	.000
Hospital Staff Status	.06520	.799	.55788	.31123	.00009	-.02509	6.39070	0
Proportion of Admission, Independent in Bathing	.05907	.808	.55796	.31131	.00008	.00582	6.20301	.000
Next of Kin, Friend	.05696	.811	.55803	.31139	.00008	.00592	6.02538	0
Medical School, West	.03548	.851	.55807	.31144	.00005	-.05080	5.85627	.000
# in Practice Affiliation	.02571	.873	.55810	.31148	.00004	.00061	5.69547	0

confused (2.0%) on a higher proportion of admission experienced higher total charges. A higher proportion of male decedents experienced high charges (2.3%) as did persons who listed spouse as next of kin (3.3%).

For diagnostic-related group 82, "respiratory neoplasms", 15 variables explained 65.4% of the variance in total charges. Ten variables added at least 1% to variance explained when they entered the equation. Those persons who had a higher proportion of admissions preceded by home health care, had more secondary diagnoses, were younger, and able to walk into the hospital had higher charges. As the number of children increased, so did total charges for this DRG. For the regression with diagnostic-related group 123, "circulatory disorders with acute myocardial infarction," 66.9% of the variance was explained, as shown in the Appendix.

Analysis was continued (Table 28) regressing decedent and physician variables against total charges in the last year of life. Thirty-nine variables explained 31.1% of the variance, of which seven variables explained 28%. Patients who experienced an increasing number of additional diagnoses experienced increased total charges (14.4%). The DRG variable explained 5.0% of the variance. Decedents' age was associated with decreased total charges, as were family practitioners. Decendents whose secondary payment source was "other" and who had home care experienced significantly higher charges holding other factors constant.

An additional regression equation including treatment variables as well as patient and physician variabesl expalined 75.1% of the variance. Five variables explained the majority of the variance, especially length of stay (60.5% of the variance). As length of stay increased, so did total charges. An additional 7.3% of the variance was explained by the number of physicians writing orders per admission. As the number of physicians writing orders increased, so did total charges. Diagnostic-related groupsing accounted for 1.8% of the variance while total days for the year in intensive care accounted for another 1.5%

Discriminant Analysis of Decedents and Survivors

A discriminant analysis between the decedents and survivors using patient, physician, and treatment variables was performed. The first variable to enter the equation was proportion of discharges home which accounted for 25% of the variance. It is not surprising that the mean proportion of discharges home was lower (.229) for the decedents than for the control group (.737). The number of admissions added 15.4% to the variance explained. The decedents experienced more admissions than the controls with a mean of 2.151 in contrast to 1.678. Internists as attending physician explained 1.6% of the variance with decedents more likely to have an internist as an attending physician with a mean of .684 in contrast to .483 for the controls. The proportion of admissions from a nursing home explained 1.0% of the variance. A higher proportion of admissions for decedents were from nursing homes (.188) in contrast to .100 for controls. The proportion of admissions to intensive care explained almost 1.0% (.009983). Decedents had a slightly lower proportion of admissions to intensive care with .278 for the decedents and .348 for survivors.

STEP	ACTION ENTERED REMOVED	VARS IN	WILKS LAMBDA	SIG.
1	Proportion of Discharges Home	1	.749624	.0000
2	Number of Admissions	2	.595981	.0000
3	Internist	3	.579893	.0000
4	Proportion of Adm. from Nursing Home	4	.569716	.0000
5	Proportion of Adm. to Intensive Care	5	.559733	0
6	Average Level of Intensity of Care	6	.549476	.0000
7	Year DAys in Intensive Care	7	.542317	0
8	Proportion of Adm. to Cardiac Care	8	.537615	.0000
9	Number of Additional Diagnoses	9	.534321	.0000
10	Proportion of Admissions - Walk	10	.530654	.0000
11	Proportion of Adm. Independent in Toileting	11	.527476	.0000
12	Single Specialty Practice Arrangement	12	.525005	.0000
13	Average Daily Charges	13	.522744	0
14	Physician Sex	14	.521536	.0000
15	Number of Office Locations	15	.520352	.0000
16	Family Practitioner	16	.518976	.0000
17	Board Certified	17	.517522	.0000
18	Medical School, Minnesota	18	.516553	.0000
19	Medical School, East	19	.514453	.0000
20	Medical School, Central	20	.512279	.0000
21	Single Specialty Practice Affiliation	21	.512962	.0000
22	Physician Age	22	.510990	.0000
23	Medical School, West	23	.509683	.0000

When patients' number of children entered the discriminant analysis, it was clear that decedents with more children had higher total charges. Possibly higher charges are due to the difficulty of coordinating greater family input into decision-making, or perhaps having a larger family puts more pressure on physicians to allocate more resources. Having a spouse as next of kin sometimes is associated with higher charges, depending on diagnosis. Generally, next of kin explained only a small percent of the variance in total charges but its consistency is impressive.

Conclusions

Many of the variables explaining hospital charges in this study confirm the results of previous research. However, the study contributes new information particularly concerning family members' influence, associated with increased charges. The finding that more resources are expended on males raises potential equity issues, and the relationship between secondary payment sources (Medicaid and "other") and total charges is considerable. Also, it is apparent that the increased use of family practitioners would reduce health care costs.

One of the study's most important findings is that the number of additional diagnoses beyond the primary diagnosis strongly predicts total charges in the last year of life. One can safely assume that additional diagnoses increase the complexity of a case, and in turn the treatment charges rise. The finding that for several of the diagnostic-related groups, a wide range of total charges occurs suggests that the patients' conditions in reality are quite dissimilar as well as variance in physicians' methods of treating the same DRGs. The fact that DRGs' explanatory power is weaker for decedents than survivors bears further explanation, confirming the importance of other variables as explored in this study.

The inconsistency of the observed effect of physicians' practice affiliation or hospital charges suggests that professional associations may not be a critical variable. Possibly the small amount of variance explained by physician variables in this study indicates that hospitals themselves may inspire physicians to practice in similar (cost effective) manners. Continued examination of statistical data from this study is in process. We appreciate

the cooperation of our study hospital in this exploratory research effort. Policy implications remain to be discussed with the funding agency whose response is anticipated by July 1, 1984.

SECTION VI

APPENDIX

FOOTNOTES

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GLOSSARY

Decedents are subjects who were selected for inclusion in the study because they died in the study hospital during the study year.

Controls are patients selected for inclusion in the study because they were discharged alive from the study hospital during the study period and were matched with decedents on age and admission to intensive or cardiac care.

High-charge patients are patients whose charge for all admissions in the study period are in the highest 25 percent of charges.

Low-charge patients are patients whose charges are in the lowest 25 percent of charges. The remaining 50 percent are middle-charge patients.

Distance from home residence is calculated based on distance of patient's residence zip code to the study hospital. All calculations will be from the geographic center of the residence zip code to the study hospital. For patients admitted from a nursing home, the zip code of their residence rior to being admitted to a nursing home will be used when available.

Intensity of care is calculated based on the ratio of charges for ancillary services to other charges.

Average charge per day is calculated by dividing total charges by length of stay.

Total hospital charges per study year is the sum total of the total charges for each admission during the study year.

Total charges per admission is measured by the total hospital charges for all days during that admission.

Study year is defined specifically for each patient as the year prior to their death for the decedents and the year prior to the sutdy selection admission for the controls.

Attending physician is the physician who either provided the majority of the patient's care or coordinated the patient's care as judged after record review by the hospital's medical records coder.

Admitting physician is the physician who was named on the hospital record as ordering the patient's admission.

Terminal or study selection admission is the admission during which the decedents died.

Study selection admission is the randomly selected admission for which the control was selected for inclusion in the study.

Number of physicians per admission is calculated based on the number of physicians writing orders on the patient's medical record during that admission.

Bathing is the over-all complex behavior of giving water and cleansing the whole body.

Toileting is the act of going to the room termed the "toilet room" for bowel and bladder functions, transferring on and off the toilet, cleansing after elimination, and arranging clothes. Note that toileting is not concerned with continence.

Transferring is the process of moving in and out of bed and in and out of a chair.

Mental status measures the patient's ability to socially interact in a manner consistent with reality including such things as knowing one's name and the year.

Patient Name _____ DOB _____ Age _____

R# _____ Account # _____

Adm Date _____ Discharge Date _____ Adm # _____

1. Marital Status 1=single 3=widowed 5=divorced _____
   2=married 4=separated 6=ND

2. Emergency Notification (if blank, use NOK or guarantor)
   Relationship 1) spouse 2) son or daughter 3) other relative _____
   4) friend 5) other 6) ND

3. Admitting Diagnosis Code: _

4. Admitting Dr. Number: _____ 1=possible,probable
   2=definite

5. MD's Writing Orders by Number _____

6. Patient Profile
   Number of living children: _____ 99=ND
   Receiving nursing care at home prior to hospitalization: 1) yes _____
   2) no
   3) ND

7. Data Base
   Admitted per 1) walk 2) wheelchair 3) litter 4) ND _____
   Previous hospitalizations: 99=ND 98=any vague number
   By patient report 1) 1982____ 2) 1981____ 3) 1980____
   4) 1979 or older____ 5) number year vague____
   By count from MH Chart 1) 1982____ 2) 1981____ 3) 1980____
   4) 1979 or older____

8. Mental Status on Admission (within 24 hours)
   1) alert 2) alert most of the time 3) confused most of the time _____
   4) confused all the time 5) unconscious 6) not documented

9. Activities (see description sheet)

Bathing	1	2	3	4	5	_____
Toileting	1	2	3	4	5	_____
Transferring	1	2	3	4	5	_____

10. Admitted from Nursing Home 1) yes 2) no _____
    If "yes", zip code of previous home address if available:_____

Secondary Payment Sources:

1) Medicaid 2) insurance 3) self/spouse _____
4) other 5) Methodist Senior Federation

Subtotal 001	Room and Board	_ _ _ _ _
Subtotal 002	Drugs	_ _ _ _ _
Subtotal 003	Dressings/Supplies	_ _ _ _ _
Subtotal 004	Laboratory	_ _ _ _ _
Subtotal 005	X-ray	_ _ _ _ _
Subtotal 006	Procedures/Supplies	_ _ _ _ _
Subtotal 008	Other Services	_ _ _ _ _
Subtotal 009	Miscellaneous	_ _ _ _ _
Total Charges		_ _ _ _ _

M.D. Variables — Hospital Records

M.D. Name _____

_____

Age in years _____

Sex: M F 1=male, 2=female _____

Department/Specialty: 1) family practice, 2) internist/medicine, 3) surgery, 4) ob-gyn, 5) other _____

Board certified: 1=yes, 2=no, 3=not documented _____

Office location:

# of office locations: 1=yes, 2=no _____

Distance of primary office from (nearest mile)

Meadowbrook = 0 _____

St. Louis Park:

Northlands	1
Bloomington	12
Eagan	
Hopkins	3
Ridgedale	7
Plymouth	7
Minnetonka	12
Metropolitan	8
Meadowbrook	.
Other _____	

# of hospitals with privileges: _____

Hospital staff status: 1=active, 2=provisional, 3=courtesy _____

Years on hospital staff: 99=unknown _____

Years since graduated from medical school: _____

1) Minnesota
2) New England
3) Middle Atlanta
4) South Atlanta
5) East North Central
6) East South Central
7) West North Central (excluding Minnesota)
8) West South Central
9) Mountain
10) Pacific
11) Other _____

Practice affiliation: Group = _____

Total = in group _____

Total = in M.D. specialty _____
(1) multispecialty _____
(2) single specialty _____
(3) group practice _____
(4) other _____

PAS SUBSTITUTE DATA

	# Columns	Column #
index diagnosis	5	_____
other diagnoses 2	5	_____
other diagnoses 3	5	_____
other diagnoses 4	5	_____
other diagnoses 5	5	_____
other diagnoses 6	5	_____
other diagnoses 7	5	_____
other diagnoses 8	5	_____
other diagnoses 9	5	_____
other diagnoses 10	5	_____
MDC	2	_____
DRG	3	_____
operating procedure within 6 hours (#=1)	1	_____
operating procedure hospital day	2	_____
indexed procedure (8)	4	_____
tissue of Col 8	1	_____
other procedures (10)	4	_____
tissue of Col 10	1	_____
other procedures (12)	4	_____
tissue of Col 12	1	_____
other procedure (14)	4	_____
tissue of Col 14	1	_____
other procedure (16)	4	_____
tissue of Col 16	1	_____
surgeon	4	_____
attending physician	4	_____
consultation C=yes=1	1	_____
selected case	1	_____
age of admission	3	_____
race W=1, B=2, A=3, I=4, H=5, O=6	1	_____
sex M=1, F=2	1	_____
admission type column 1, 1=E, 2=U, 3=R, 4=combination	1	_____
admission type column, A=1, S=2, T=3, 4=combination	1	_____
disposition	2	_____

1=D, Expired-no autopsy
2=A, Expired-autopsy
3=P in front of either A or D
4=O in front of either A or D
5=C in front of either A or D
6=Combination of P, O, C, and A or D
7=X
8=T
9=N
10=1
11=0
12=H
13=blanks

	# Columns	Column #
hospital services	2	
discharge month	2	
stay in days	3	
days in care unit-type, 1=1, C=2, S=3	1	
# days	2	
principal payment service, 1=M, 2=C, 3=V, 4=G, 5=W, 6=B 7=1, 8=5, 9=N, 10=11	2	
secondary payment source		
Col 33, 1=M, 2=W, 4=1, 3, 5, 6, 7=combination	1	
Col 34, 1=C, 2=B, 4=V, 3, 5, 6, 7=combination	1	
Col 35, 1=G, 2=5, 4=0, 3, 5, 6, 7=combination	1	
locality=zip code	5	
patient number	6	
birth date	6	
admission day of week 1=Mon, 2=Tue, 3=Wed, 4=Thur, 5=Fri, 6=Sat, 7=Sun	1	
admission date	6	
discharge day of week 1=Mon, 2=Tue, 3=Wed, 4=Thur, 5=Fri, 6=Sat, 7=Sun	1	
discharge date	6	

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